MAY 4 1923
Chemical Library
MAY 7 1923
CHEM. LIBRARY

TABLE OF CONTENTS - - - - 1265

THE IRON AGE

Published Weekly
Vol. 111, No. 18

NEW YORK, N. Y., MAY 3, 1923
Entered as second-class matter June 18, 1879, at Post Office at New York under the Act of March 3, 1879

Six Dollars a Year
Single Copy, 25 Cents

FAFNIR

Double Row Radial Ball Bearings

are manufactured with the utmost accuracy from thoroughly heat treated (not case hardened) chrome alloy steel.

Deep race grooves and large sized balls make *Fafnir Double Row Radial Ball Bearings* heavy load carriers.

They are particularly useful when the design of the surrounding parts of the mechanism requires a bearing of minimum outside diameter.

Fafnir Ball Bearings are made in all standard types and sizes.

The Fafnir Bearing Company
Conrad Patent Licensee
New Britain, Conn.

CHICAGO, ILL., 537 South Dearborn St.
CLEVELAND, OHIO, 1016-1017 Swetland Bldg.
DETROIT, MICH., 120 Madison Ave. Room 511
NEW YORK, N. Y. 5 Columbus Circle
NEWARK, N. J., 271 Central Ave.
PHILADELPHIA, PA., 1427 Fairmont Ave.

FAFNIR

"Until we get that STEEL —"

"PRODUCTION held up—men and machines idle—delivery promises indefinite —until we get that steel." This is the situation many manufacturers are facing today.

That there is a steel shortage cannot be denied. Mills are booked far ahead, deliveries are extended and consumers are experiencing difficulty in securing enough steel to meet current requirements.

Meet your production schedules by getting immediate shipment from one of the six Ryerson Steel-Service Plants.

Order from the Ryerson Journal and Stock List—If you do not have a copy, write for it now.

JOSEPH T. RYERSON & SON INC.
ESTABLISHED 1842

CHICAGO ST. LOUIS CINCINNATI DETROIT BUFFALO NEW YORK
BRANCH OFFICES: DENVER HOUSTON JERSEY CITY
MILWAUKEE MINNEAPOLIS NEWARK SAN FRANCISCO TULSA

RYERSON STEEL-SERVICE

THE IRON AGE

New York, May 3, 1923

ESTABLISHED 1855 VOL. III, No. 18

New Wire Mill Has Unusual Features

Automatic Coiling and Conveying System—Slow Start for Motor-Driven Wire Blocks—Continuous Wire-Drawing Machines

BY J. E. MC DONALD

A NUMBER of new and interesting developments in the rod-rolling and wire-drawing industry are encountered in the new mills of the Whitaker-Glessner Co. at Portsmouth, Ohio, which are now in operation.

These include, in the rod mill, a near return in principle to the original type of Morgan continuous mill, employment of seventeen passes instead of the conventional sixteen, and the division of the four finishing passes into two separate roll trains of four strands each, allowing individual treatment and adjustment of each strand. Another radical development—and the first to be installed in any mill—is a coiling and conveying system, automatically controlled, which moves intermittently instead of continuously, a conveyor serving each reel.

In the wire-drawing room the greatest advances made in wire-drawing equipment in years are noted, including individual motor-driven wire blocks which give a slow start and variable speed instead of an abrupt start and fixed speed; also continuous drawing machines, in which the bugbear of "slippage" is entirely eliminated. These, as well as many other interesting developments, are more completely described in the following paragraphs, prepared from information secured from the officials of the company at Portsmouth.

The rod and wire mills are located on a triangular site of approximately 25 acres. One corner of the triangle is connected with the other finishing mills of the steel works, so that the new mills are served by the same inter-mill system of railroad tracks, which en-

Wire-Drawing Blocks with Individual Motor Drive Are Installed, Marking a Most Important Advance in the Design of Wire-Drawing Machinery

(Below) Assembly of One Section of Individually Motor-Driven Wire-Drawing Blocks Before Installation

ables the present crews and motive power to handle all the required switching.

Of concrete, steel and brick construction, the new buildings cover a total area of 365,000 sq. ft. The arrangements of the various departments is sufficiently flexible to permit future expansion, limited only by property line boundaries, so that each department may be considerably enlarged without encroaching upon the adjacent departments. The buildings are practically all of the Aiken roof type, which insures a maximum of natural light.

Owing to the triangular shape of the property, it was not practicable to have the progression of manufacture in a straight line. That was overcome by what is best described as a "horseshoe layout," which means that material, in going through the various manufacturing processes, will actually travel after the fashion of a horseshoe or loop. This method of manufacturing progression has numerous advantages over the straight line arrangement, one of the principal ones being that all departments are more nearly contiguous to the various shops, store rooms and other maintenance departments.

The center of the horseshoe has been left entirely clear for future development, and each department also provides a considerable area of available floor place for the immediate addition of a large amount of machinery that will permit the operating organization to meet, without undue delay, the peculiar needs of the respective territories of the sales branches of the company. Such needs usually develop immediately after the starting of almost any new enterprise of this character, and the company, in providing room for immediate expansion of its facilities for increasing its output of any desired product, is following a far-sighted policy.

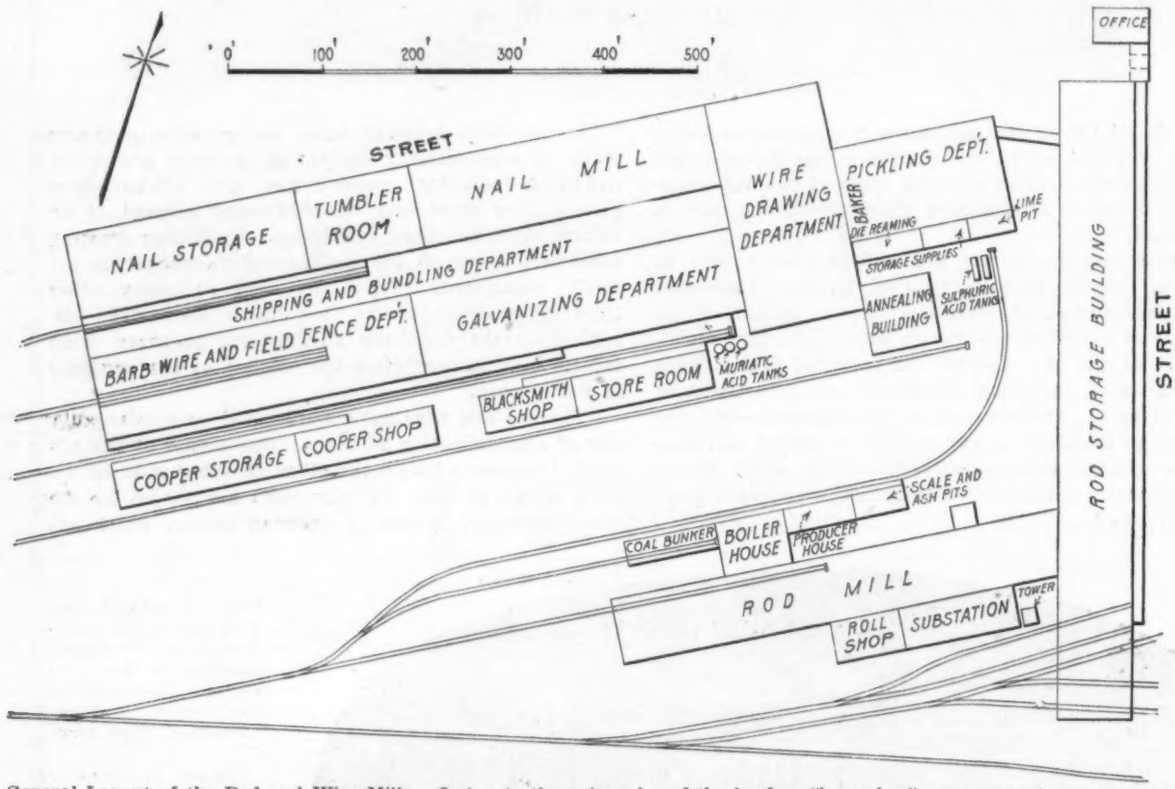
Rod Mill

The rod mill proper is housed in a building 70 x 475 ft., which connects with an electric substation building 45 x 200 ft., of which length the roll shop occupies 75 ft. These buildings are directly connected and approximately at right angles to the rod storage and shipping building, which measures about 80 x 682 ft.

This rod mill can best be described as being practically a return in principle to the original type of Morgan continuous mill, in that the repeater system, which has been used more or less in recent years in continuous rolling, is considerably modified. There are, however, a number of novel features incorporated that were not present in the old direct type of continuous rod mill. Seventeen passes are employed, thus enabling the mill to produce more easily from a 30-ft. by 1¾-in. square billet a more uniform product, as the mill is rolling a No. 5½ gage (0.200 in) instead of the customary No. 5 gage (0.207 in) rod. The advantage of such a product will be obvious to those familiar with the manufacture of wire and wire products.

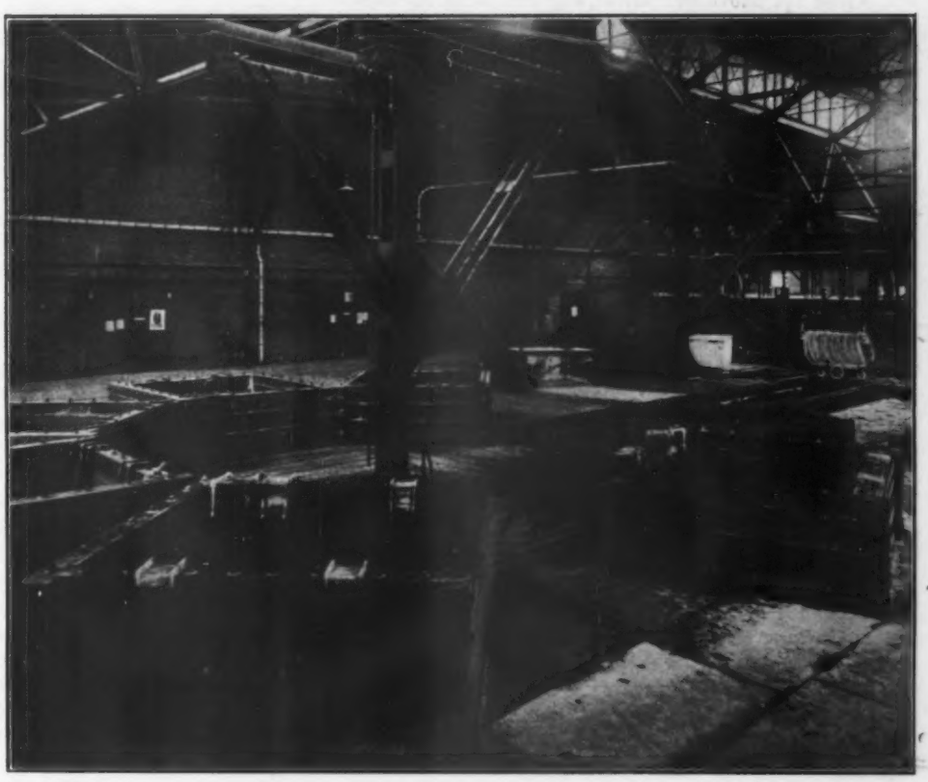
Another departure from the conventional method is the division of the four finishing plants into two separate roll trains of four stands each. This can be better described by saying that the mill is what is known as a two-strand mill, each set of rolls carrying two strands up to and including the thirteenth pass. After leaving the thirteenth pass the strands separate into the form of a "Y," after which each strand is individually finished in its own last four passes. This installation offers a marked advantage in enabling the roller to treat and adjust each strand individually without interference from the companion strand. This method of finishing—the first installation of its kind—is now working successfully, and marks a most advanced step in continuous mill construction.

Another radical improvement is the coiling and conveying system for transferring the rods from the mill to the rod storage. Each reel is served by its own conveyor and, as six reels are provided for coiling the rods, there are six individual conveyors. These conveyors travel intermittently instead of continuously. When the roll is discharged the conveyor automatically moves forward about 4 ft., comes to a positive stop, and remains at rest until another bundle is produced and the cycle repeated. All of the conveyors are of the muffle type, which, coupled with the intermittent pro-



General Layout of the Rod and Wire Mills. Owing to the exigencies of the land, a "horseshoe" arrangement was necessary

In the Nail Mill (Above) Are Installed 141 Machines, Mostly of the Tiffin Type. All are belt driven from motor-driven jack shafts



Rod Pickling Department at Right Showing Several of the Fourteen Track Bakers. Seven pickling vats are served by the steam jib crane in foreground

(Below) Nail Polishing and Packing Department, Showing the Tumblers

gressive features, offers what would seem to be the last word in producing a rod free from oxidization, and at the same time guaranteeing a uniform softness, free from hard and brittle spots.

The roughing stands are driven by a 2800/1400-hp. 400/200-r.p.m., 600-volt, d.c. motor, and the intermediate and two finishing stands are each driven by an 800/355-hp., 706/320-r.p.m., 600-volt, d.c. motor. Speed regulation on these motors is obtained by means of field resistance on the motors and also by means of voltage regulation on the generators which supply the motors with power.

The mill motors take power from a 3000-kw., 2200-volt a.c. to 600-volt d.c., 600-r.p.m. synchronous motor-driven generator set, consisting of two 1500-kw., 40-deg. temperature rise, 600-volt d.c. generators mounted on a common bedplate and direct connected to one 4200-kva., 2200-volt, 3-phase, 60-cycle, 0.80 per cent power factor synchronous motor. The d.c. mill motors and the d.c. generators are excited by a 90-kw., 2200-volt, a.c. to 250-volt d.c. motor-driven exciter set.

All of the above equipment, together with the necessary switchboards and control boards for the motors, two 750-kw., 2200-volt a.c. to 250-volt d.c. motor-generator sets, and three 400-kva., 2200-volt to 220-volt, single-phase transformers are installed in the brick substation building, 45 x 125 ft., located adjacent to the mill building. The two 750-kw. motor-generator sets are used for driving the individual motor-driven wire blocks in the wire-drawing department, electric cranes and other direct current surface motors. Power is transmitted between the substation and the various points of consumption by eight circuits of 1,000,000-c.m. wire, installed in fiber conduits run under-ground and set in concrete. The three 400-kva. single-phase transformers furnish the power for the various a.c. service motors throughout the plant.

Rod Storage

In the rod storage building, which covers an area in excess of 54,000 sq. ft., is installed a hook carrier which picks up the bundles of wire from the conveyors installed in the rod mill proper. The carrier can convey the rods the full length of the rod storage building, thus permitting of a most convenient method of distribution for storage, shipping or for further working in the wire-drawing and finishing mills. While in transit on this carrier the rods are gaged, culled and bundled. The rod storage is served by an overhead electric traveling crane, which covers the entire area, and which is used for shipping and such other handling as may be required.

Pickling is done in double rectangular tanks of the latest design, served by two 16-ft. radius steam jibs. Ample provision has been made for the storage of acid and lime. An improved 14-track baker has been installed, each track holding eight buggies of rods, giving the baker a total capacity of 112 buggies. This building measures 101 x 175 ft., with a 24-ft. addition the full length for storage.

Wire-Drawing Department

Connected with the pickling department is the wire-drawing room, 128 x 250 ft., which provides ample space for drawing the entire tonnage of rods produced by the rod mill. It is here, perhaps, that the greatest advances have been made in the development of wire-drawing machinery as typified in the installations. It may be permissible to digress to a certain extent, in order to enumerate some of the more important problems facing the designer of wire-drawing machinery.

It can be stated that little or no progress had been made for many years in the principles of wire-drawing machinery, for while there have been some refinements in design, the fundamentals have been unchanged. It is, therefore, a matter of general interest that the wire-drawing equipment of this new plant represents a great and forward step in the development of this class of machinery. The finer gages are produced by means of the Morgan-Connor continuous machines, an English invention which in recent years has been more fully developed and refined in this country.

Many efforts have been made unsuccessfully to draw wire continuously from the rod to the finer gages of finished sizes, but such efforts have not met with commercial success. The basic reason for failure was in every case the same—slippage around the drum—hence mechanical compensating features were invariably used, and always with the same disappointing results. The Morgan-Connor system is unlike any of these previous methods for the reason that "slippage" is entirely eliminated and the compensation for irregularities is effectively provided for by the fact that each drum in the train serves as a magazine to either pay off or take on the wire as may be required by the companion drum.

Individual Motor-Driven Blocks

The coarse wire blocks, or what in wire mill vernacular are known as "ripping blocks," are also of an entirely new and improved design. Instead of the blocks being driven in groups from one large motor, each drum is provided with its own individual motor. The many advantages of this arrangement are almost too numerous to describe here, but will be fully appreciated by the wire-drawer. It would be well to dwell for a moment on perhaps the most important one—the elimination of the quick-starting drum—long regarded as one of the greatest nightmares of the wire-drawing business.

For many years it has been the ambition of designers of wire-drawing machinery to produce a slow-starting block—one that not only starts slowly, but which continues in its slow rotation until everything is working smoothly and thus permits the operator to accelerate at will the speed of the drum, and to proceed with such acceleration until physical limitations have been reached. With the new individual motor-driven block it is possible, by means of a conveniently placed electrical control, actually to start the block at 4 r.p.m., and to continue at this slow speed just as long as may be required for a smooth and successful start, after which, by a further manipulation of the control, the drum may be brought gradually up to any desired maximum speed. There is also an entire absence of cams, clutches, pulling-in devices and other accessories which have heretofore not only been indispensable, but which also have always been looked upon as necessary evils and adjuncts. What the substitution of the slow-starting block really means in the wire-drawing industry will be appreciated by officials who have been put to the annoyance and expense involved in labor turnover, due primarily to the hazard of the quick-starting drum.

The Nail Mill

Provided with an initial equipment of 141 machines, mostly of the Tiffin type, the nail mill department is so arranged that this number can be almost doubled. An improved method of anchorage for these machines has been provided so that a regrouping of the sets, or a respacing of the machines, can be most conveniently made. This is made possible by the fact that the foundation scheme is of a continuous design, which permits of almost unlimited flexibility. This department measures 91 x 325 ft.

From the machines the nails are conveyed to the polishing barrels by an electric overhead traveling crane, which places the containers on a mezzanine floor, where they are charged into the tumblers with the least amount of manual labor. The polishing barrels, of 25 kegs capacity, are of an entirely new de-

Morgan-Connor Continuous Wire-Drawing Machines, for Drawing the Finer Gages of Wire Continuously From the Rod

sign, and all are individually motor-driven, the power being transmitted by means of worm gearing. Each polishing barrel is provided with a shaking mechanism, which means that the smallest possible size keg or container will be used in packing the nails. After packing, the nails are handled for storage or shipping by means of automatic conveyors which travel the full length of the nail warehouse. The tumbler room is 91 x 125 ft., while the nail storage measures 91 x 250 ft.

Galvanizing and Other Departments

While the galvanizing department is equipped now with two 36-wire galvanizing units, room has been provided for a third unit to be added later, and the department can be extended easily to meet future commercial demands. The galvanizing take-up frames will be controlled by an electrical variable speed device which gives the supervisor a greater range of speed than has heretofore been possible, even with the modern variable-speed motors. A range of one to ten may be had without the employment of electrical resistors or gear transmission, or without interruption in the galvanizing process. This department measures 91 x 350 ft.

In the fence department are 36 machines, thus enabling the company to furnish practically any type of barb wire. At a later date a number of field fence weaving machines will be added. The fence and barb wire department is 91 ft. wide and 350 ft. long, being a continuation of the galvanizing building.

A thoroughly modern and adequate machine shop has been provided, and was used for a considerable part of the construction work. This is supplemented by carpenter, pipe and forge shops. In addition the company has a completely equipped cooper shop and a large cooper storage. Between the fence and galvanizing department and the nail mill and storage is a shipping and bundling building, 44 x 700 ft.

Steam is provided by two 500-hp. Connolly boilers, equipped with Riley stokers, and Morgan gas producers provide the fuel for the rod mill furnaces.

A unique feature of the entire plant is the well worked out system of indestructible truckways, which were laid out with a view to the advantages of moving all material by means of storage battery tractors. The plant is also amply provided with overhead crane service which, supplemented by the tractor service, means that the laborious transferring of material by manual labor has been reduced to a minimum. The type of construction that has been followed throughout, both as to buildings and floors, will result in a maintenance cost that will be practically nil. Special grading and retaining walls place the mill floor levels above the flood stage of the Ohio River.

The Consumers' Power Co. has announced that it would double the size of its new power station on the Saginaw River at Milwaukee, Mich., between Saginaw and Bay City. This will increase the cost of the project by $1,500,000, making the total outlay for new work at that point $4,000,000. The original plans for this station called for a capacity of 20,000 kw. or about 30,000 hp. and an investment of $1,500,000. After construction was begun, the rapidly increasing demand for power in Saginaw, Bay City and Flint made it necessary to increase the initial installation to 60,000 hp. and the investment to $3,000,000.

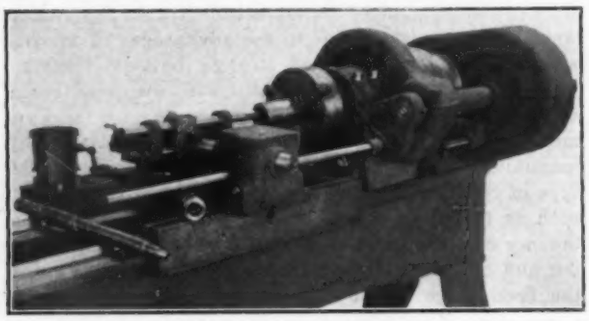
The deposits of manganese ore in the Arkansas Ozarks are described in a recent report of the Geological Survey as its Bulletin 734, by Hugh D. Miser. The bulletin describes the geography and the rock formations in that region and contains many illustrations and a colored geologic map. It is entitled "Deposits of manganese ore in the Batesville district, Arkansas," and it contains a chapter on the mining and preparation of the ores by W. R. Crane, of the Bureau of Mines.

Typical Cast Iron Truckway, in Rod Storage Building, Showing Also the Hook Carrier and Storage Battery Tractor and Train Used in Handling Materials Throughout the Entire Plant

Oil Grooving Attachment for Lathes

An attachment for use on engine lathes and designed to groove bearings or shafts of any diameter that can be made to revolve in the lathe has been brought out by the Mueller Machine Tool Co., Cincinnati. Oil grooves can be cut in either single or double figure eight style without re-chucking the piece. The cutter bar of the attachment has a double-pointed cutting tool to permit grooving consecutively on opposite sides of the hole. The lathe spindle makes two revolutions to one complete stroke of the tool in the cutter bar.

When used in connection with an engine lathe of the company's manufacture, the driving shaft of the attachment enters into the lathe head directly below the back gear pinion. A rawhide pinion on the end of this driving shaft meshes with the face gear on the lathe spindle. For use with lathes of other manufacture a chain drive is provided, as shown in the accompanying illustration. The sprocket gear is placed on



Oil Grooving Attachment for Engine Lathes. Oil grooves can be cut in either single or double figure eight style without rechucking piece

the nose of the lathe spindle before the chuck is attached and the chain on the sprocket gear connects with a sprocket pinion on the splined driving shaft.

The driving shaft of the attachment is supported by an adjustable bearing and passes through the driving box which is bolted or clamped on the V's of the lathe carriage. A worm and worm wheel in the driving box transmits the power to a splined shaft above. An adjustable graduated cross bar at the end of this splined shaft acts as a crank to move a crosshead for any stroke required within a range of 1½ to 6 in. in length. The crosshead carries the cutter bar which travels back and forth in a support bolted on top of the lathe compound rest.

The cutting tool can be brought to any position while the lathe is in motion. Taper holes and shafts can be grooved by swiveling the compound rest slide, as the sliding block in the cross head has a ball and socket bearing. The cutter bar can be raised or lowered to correspond with the center line of lathes of various swings.

Improves Mercury Thermometers

A new method of tube construction intended to overcome the difficulty of reading mercury thermometers has been acquired by the C. J. Tagliabue Mfg. Co., 18 Thirty-third Street, Brooklyn, N. Y.

The new feature, known as the Tag-Hespe red reading column, shows a broad red line from the top of the mercury column to the top of the tube. As the mercury rises the red line is covered and as it falls a correspondingly greater length of the red line is visible. This feature is claimed to bring to the accurate mercury thermometer the easy readability of the red spirit thermometer.

The proposal to admit foundry laborers to membership in the Iron Molders' Union of North America was defeated in a nation-wide referendum. The question was submitted in the form of an amendment to the constitution. A referendum on the question of holding the annual convention was submitted to a vote, and Cleveland was selected as the place of the meeting, to be held in September.

Proposed Merger of Parish & Bingham and Detroit Pressed Steel Co.

Plans have been announced for the proposed consolidation of the Parish & Bingham Corporation, Cleveland, and the Detroit Pressed Steel Co., Detroit, manufacturers of automobile frames and other sheet metal stampings. A new company to be known as the Midland Steel Products Co. is being organized to take over the two plants. E. J. Kulas, president of the Parish & Bingham Corporation, will be at the head of the new company and H. A. Flinterman, vice-president of the Detroit Pressed Steel Co., will be vice-president of the Midland company. The new company will have a capital stock of 50,000 shares of no par common stock, $2,500,000 in 7 per cent first mortgage bonds, and $7,000,000 in 8 per cent participating preferred stock. The consolidation is subject to the approval of the stockholders of both corporations.

A meeting of the stockholders of the Cleveland company will be held May 5, and of the Detroit company May 10, to act on the merger. The two companies are said to be doing $12,000,000 worth of business a year. As originally proposed, the consolidation was also to include the Hydraulic Steel Co., Cleveland, but that company finally decided not to merge in the new organization.

Confiscation of Coal Declared Illegal

BIRMINGHAM, ALA., May 1.—The Alabama Supreme Court, through Chief Justice Anderson, has rendered an interesting decision with regard to confiscation of coal by railroads. The court decides against its legality in an action brought by a consignee of coal taken by the Southern Railroad for its use. The court says: "If such a custom could govern the shipment of coal, it could be established so as to extend to other goods and commodities, and it would be contrary to public policy to recognize a custom which would permit carriers to convert to their own use articles they had contracted to deliver by, in effect, stepping into the shoes of the consignee."

Alabama War Rates Sustained

WASHINGTON, May 1.—In a decision announced last Saturday, the Interstate Commerce Commission held that rates in effect during Federal control from June 25, 1918, on iron ore, coal, coke and limestone from producing points in Alabama to various blast furnaces in that State were not unreasonable or unduly prejudicial. The complaint filed by the Alabama Co., and other manufacturers, was accordingly dismissed. While the rates were intrastate, the commission had jurisdiction during the period of Federal control, but said that it has no authority to deal with the present rates or to prescribe rates for the future.

Coke Rates Suspended

WASHINGTON, May 1.—The Interstate Commerce Commission has suspended from May 1 to Aug. 29 increases in rates on by-product coke from the Cleveland district to points in New York which have been proposed by the Wheeling & Lake Erie Railroad, and meanwhile will investigate. Existing rates to northern New York territory from Cleveland are $2.39 per ton as against proposed rates of $2.76 to Niagara Falls, $3.40 to Lockport, and $3.19 to North Tonawanda.

Japanese Iron and Steel Production

Figures of the Japanese Bureau of Mines show that the production of pig iron in Japan in the first half of 1922 was 341,429 tons (metric) compared with 649,686 tons in the whole of 1921. Ferroalloys amounted to 4633 tons in the first half of 1922 compared with 7575 tons in all of 1921. Steel ingots and castings in the two periods amounted to 430,476 tons and 832,428 tons. Rolled steel amounted to 283,217 tons and 479,587 tons. Steel forgings and castings, etc., amounted to 43,313 tons and 82,242 tons.

New Long-Life Mold Development*

Refractory Lined Mold With a Cast Iron Backing—The Principles of Its Construction—400 Castings Possible Per Hour

BY DR. RICHARD MOLDENKE

THE foundryman has always felt that the destruction of the mold every time a casting is poured is an inefficient procedure. Indeed, the making of molds which could be used over and over again dates back to the bronze age, when implements of warfare and domesticity were made in stone molds the two parts of which were suitably hollowed out, clamped together and poured much as our present brass ingots. These stone molds are in reality the first "long-life" molds on record.

In the development of the iron industry, with molten metal at first only as an undesirable occurrence in the operation of the small blast furnaces used, the open-sand mold was the only practical means of caring for the intermittent supply of metal. As time went by, however, and the iron foundry became stabilized, the desire to construct molds which would last more than one filling without damage asserted itself again and as early as the opening of the last century we have English patent records bearing upon the subject.

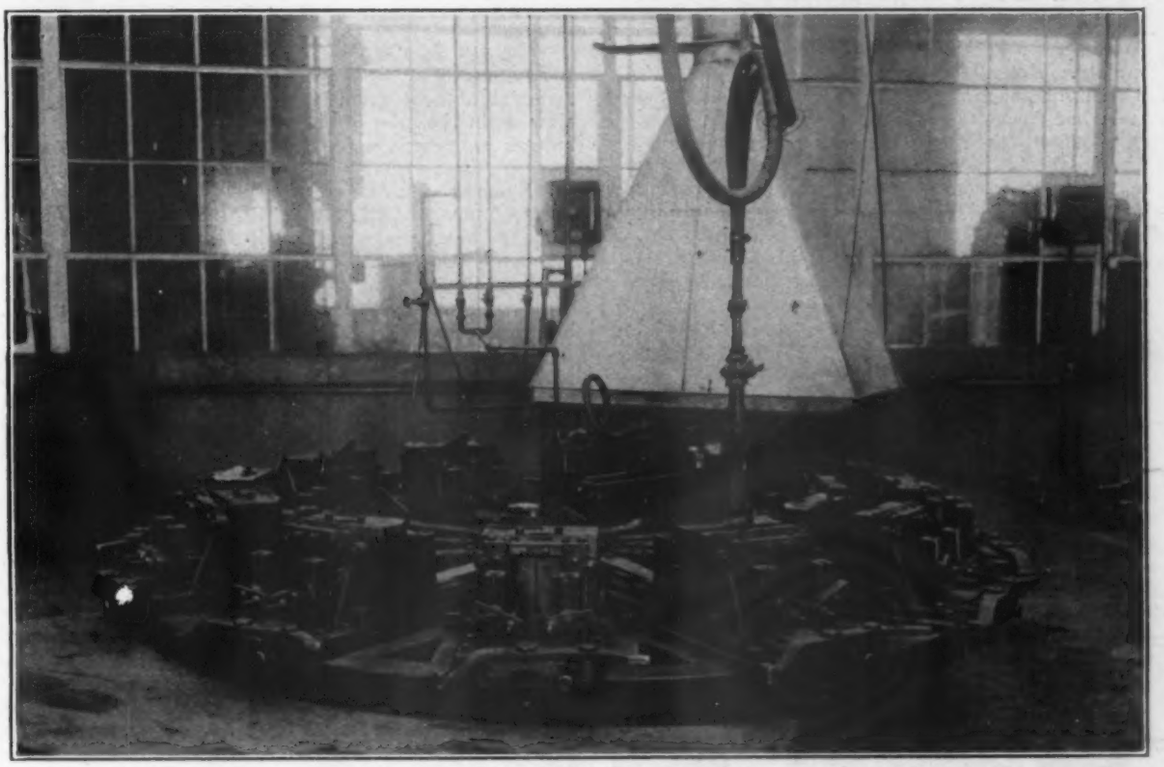


Fig. 1—Machine Showing Gas Torch for Pre-Heating Molds, Also Showing Automatic Mold Sooter in Operation

Permanent or Iron Molds

While the iron mold—or as we know it under the title of "permanent mold"—has been known and used for perhaps a century and a half, and is today attracting world-wide attention in connection with the centrifugal casting process, the method in its simpler forms has never found a solid footing in the foundry industry, the fundamental reason being that the molten metal when poured into an iron or steel mold is subjected to entirely different influences than is the case with the ordinary sand mold. The rate of cooling is much faster, with consequent more sharply defined crystallization effects and production of very fine grain structure if not actual chilling of the metal to whiteness. Even where the attempt is made to approximate the rate of cooling as in the sand mold, by suitably preheating the iron mold, this either falls short of the desired situation if the mold is to last, or when preheated sufficiently pouring must be done at longer intervals unless the life of the mold is to be sacrificed. The consequence has been that while good castings have been made with all the permanent mold processes brought out, the irregularity of product unless corrected by careful and costly annealing has militated against their commercial success.

Stone Molds or Those with Refractory Linings

For ordinary work, therefore, it seems far better to return to the old bronze age idea of using the equivalent of the stone mold—in other words, a mold of the refractory surface properties of sand and yet strong enough to yield a large number of acceptable castings before considerable redressing is necessary or before the mold must be discarded. This would be the "long-life" mold. Coming down to practical considerations, the following conditions would seem to be indicated in developing such a type of mold.

First—The mold surface must be of a highly refractory character so that the least possible heat may be transmitted inward to affect the form of the mold as well as seriously limit the

*A paper presented at the Twenty-seventh Annual Convention of the American Foundrymen's Association in Cleveland, April 30 to May. 3.

Fig. 2—Molds, with Sand Core in Position in Center Mold

rate of pouring iron for castings into it. If too much heat passes from the surface in contact with the molten iron into the body of the mold, the very purpose of the mold is lost, as it no longer will approximate the regular sand mold. Again, a too hot mold will warp and deteriorate rapidly. Hence the desirability of having the mold light and if necessary air cooled, so that the mold body may not accumulate heat unduly and thus affect the rate of pouring detrimentally. The ideal situation is that of the heat conditions in the green-sand mold from which the casting has been removed just after setting—imagining this possible without destroying the mold. But a very small depth of sand will have been seriously affected by the extreme heat, and the outer portions of the mold may still be cold.

Second—The nature of the mold material must be such that no gases are formed during contact with the molten metal until this has set. There is little chance for venting in such a mold. A momentary consideration of this matter, however, will show that, after all, it is the fault of the mold if gases are formed which affect the metal surfaces. The chilled roll is a case in point. Here is no chance for venting whatever, and yet castings are made which machine up without a defective speck. Further, it is perfectly possible to cast against a fire-brick surface successfully,

Fig. 3—Examples of Various Castings Made by Holley Process

provided the surfaces are perfectly dry and preferably warmed. Hence, if the casting surfaces of a long-life mold are of a finely granular and highly refractory nature there need be little fear of bad results due to lack of venting.

Third—The mold surfaces must be sufficiently strong to resist the cutting action of the molten metal, and be impervious to the entrance of fine filaments of iron which on removal of the casting would take some of the mold material with it. Further, the mold surfaces must not spall off. If thoroughly dried the last named action should not eventuate. The strength of the mold surfaces is a question of the bond, and the porosity of the material a matter of the fineness of grain or crystal.

Rate of Heat Removal

The crucial point in the above considerations as to the nature of a desirable mold surface is the rate of removal of heat from the molten metal—whether as slow as in the case of the ordinary sand mold, or fast enough to permit some chilling action. This rate of removal of the heat until the molten metal has safely set depends upon the refractoriness of the material in greatest measure, the temperature of the molten metal and the quantity of metal involved, as also the freezing point and other metal characteristics. For the various sections of a casting the temperature of any point of contact between mold surface and molten metal will be practically the same at first, but the depth to which the comparatively high temperatures will penetrate the mold mass will naturally depend upon the thickness of the metal which has to set against it. Thus, if in a casting, that portion ¼ in. thick imparts, say, 1000 deg. Fahr. to a point 1/64 in. within the mold mass, another portion of the same casting, 2 in. thick may show the same 1000 deg. Fahr. at a point 1/16 in. deep within the mold mass before the metal has safely set.

Practically for "long-life" mold purposes, it is the nature of this 1/16 in. or less, depending upon the thickness of the castings to be made, that must be carefully considered and conform to the requirements above enumerated. The rest of the mold mass can be any material which is structurally safe to hold the refractory surface true and well bonded, and which will absorb the heat passed through the mold surface material and promptly dissipate it. In other words, a cast iron backing to a refractory mold material forming a contact surface for the molten iron, is an ideal combination when the refractory facing of the mold is heavy enough to transmit heat at the proper safe rate, and the iron backing is light enough to dissipate the heat transmitted into it quickly.

Application in Casting Carburetors

With the above underlying principles involved in the construction of the "long-life" mold thus enunciated, it is the purpose of the writer to show how the problem of adapting these principles for everyday practical application have been worked out into a system by the Holley Carburetor Co., Detroit, and to show illustrations of the machines built for the purpose. When it is stated that by this time some of the molds have already had 10,000 castings made in them and, by reason of a close daily inspection of and attention to the refractory facing material of the molds, not one of them has yet had to be discarded, the writer feels that here is truly a new development in making long-life molds. The term "long-life" is used advisedly as against "permanent," for in the latter the supposition is that no repairs are made in the metal mold; whereas in the

former, repairs are possible and are carried out until they no longer pay.

The system devised by the Holley Carburetor Co. has been carefully worked out in every detail and is fully patented. The several steps and the reasons for operating just that way are given in the following: As previously indicated, the primary idea has been to make a very light cast iron mold, the surface of which is covered with a layer of highly refractory material, of necessary thickness, and this refractory material so protected from abrasion and penetration of fine iron filaments, that it almost wears to a polished surface and only on rare occasions need be patched up or re-faced.

For operating purposes, where the castings are not large, a group of molds is placed upon a revolving table and the several steps of the cycle can be carried out almost entirely automatically. Where the castings are larger and a table of three to eight molds would be cumbersome, single molds would be operated as long as molten metal is available.

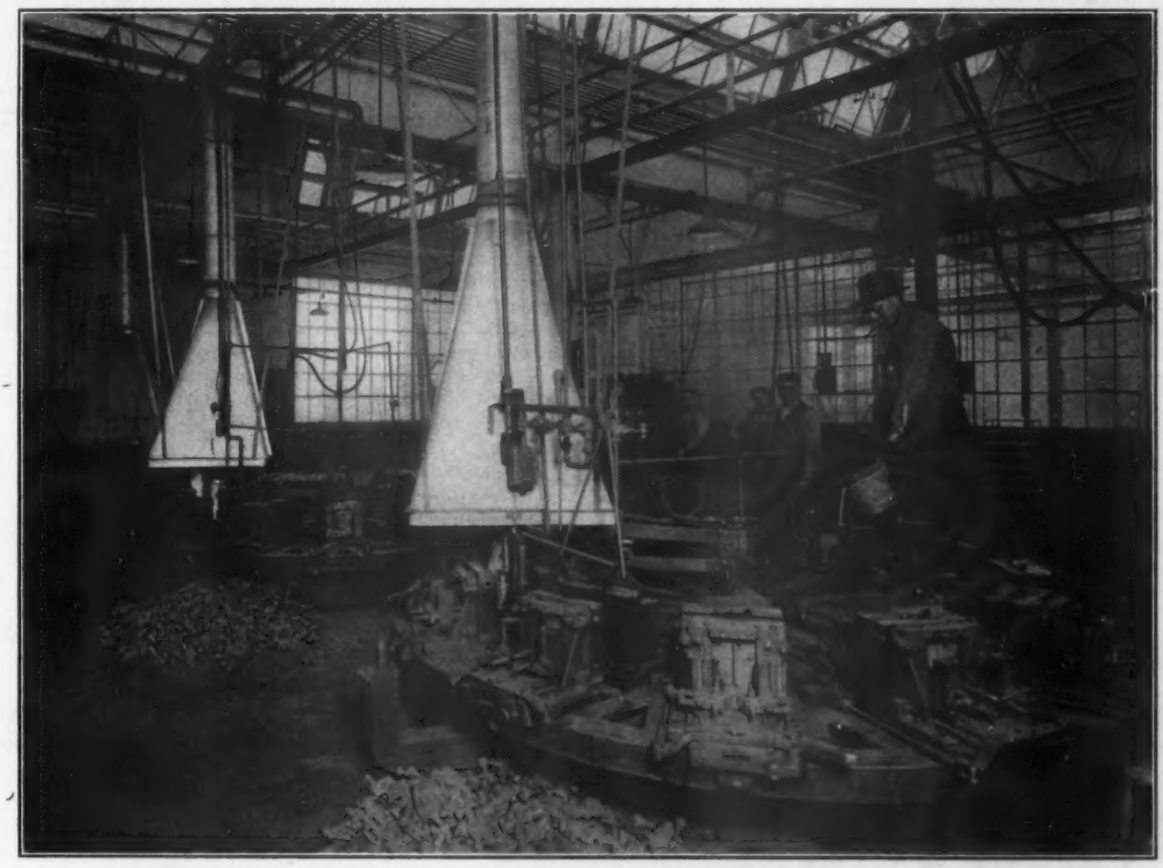


Fig. 4—Battery of Three Permanent Mold Machines in Operation in Foundry of Holley Carburetor Co., Detroit

The refractory material forming the mold surface consists of two items: The refractory material itself, and the binder to bind it to the iron backing. The refractory material can be any of the usual substances used to resist heat in the arts. Thus, magnesia, bauxite, fire-clay or kaolin will serve. The grain must be exceedingly fine and, in the application, heat must be used finally so that no question of gas-forming constituents remaining in the mass may arise. The binder must be a mineral one, an alkali silicate being most convenient, so that when heat has been applied the mass is like a thin sheet of stone. The material is preferably put on in comparatively thin layers, and each one baked on before the next is applied. The heavier facings, the final layers, can be applied by transfer from what would be a metal pattern, so that the accuracy of the finished long-life mold leaves nothing to be desired.

The final heating—in effect a skin-drying at temperatures to almost vitrify—being accomplished, the molds are placed in their proper position on the revolving table, and successively follow their prescribed course. In passing around, the two parts of the mold are drawn apart sufficiently to allow the setting of cores but, just before this, each mold successively passes a flame of acetylene gas which smokes the inner surfaces heavily. The idea of this is to interpose a film of carbon between the refractory surface and the molten metal of sufficient strength to prevent effectively any scoring action or the actual contact of metal and refractory material; this for the instant of greatest temperature effect. Most of the carbon is absorbed by the metal, but the effect is that, until the molten metal is no longer dangerous, the refractory material is protected.

After passing the flame and the position where cores can be set, the two parts of the mold are made to close automatically and are held thus until poured off and the metal has sufficiently set. Then they quickly open and the castings are forced out by pins or in other suitable ways. Next, a blast of air at high pressure rapidly blows the surfaces clean and the mold passes before the acetylene flame again. The men setting the cores or, in their absence, any attendant watches out for the mold surface condition as the molds pass by open, and any fragment of iron or core left in the mold is easily removed with a suitable tool.

The iron backing of the mold has been stated as comparatively thin. This allows—particularly if constructed with that in view—the use of air-cooling action, and where such an air blast for cooling the iron molds a little faster than they would normally do it is in use, the machine can be speeded up and thus give a larger production.

Whether pouring is done by hand or from suspended ladles; whether the man remains stationary while pouring as the mold passes him or a moving platform accompanies the table; whether the molds and cupola are together or iron has to be carried from a distance; and lastly, whether molds are poured all day long or merely the usual two or three hours, depends upon the individual situation. It may be of interest to state that with 12 single molds on the revolving table, one man can pour 400 castings of a given kind per hour. With

sand casting it takes eight times the number of man-hours to get an equal number of the same kind of castings. Further, from the nature of the pour—top pour—it is possible to feed the molds more perfectly and hence the castings made are quite free from shrinkage, even with considerable variation in sections. This makes for denser metal and the consequent benefit to strength conditions and wearing qualities.

Pistons Also Made

While the process is still in its infancy and attention has naturally been given to quantity production of the comparatively light castings required at the Holley Carburetor Works, nevertheless many automobile pistons have been made also, and these involve somewhat thicker sections. It will become a matter of heavier refractory coatings and more frequent repair of exposed points in these coatings, when larger work is undertaken.

Of the illustrations given, Fig. 1 shows a group of long-life molds arranged on the revolving table and ready for the pouring operation. Directly at the wooden platform at its right end the mold will be noted just closing up. The next five molds will be seen as closed. Pouring is done while the molds pass the wooden platform. The metal sets properly while the table brings the molds successively to the position of the one under the last pipe at the left, where the molds open for the ejection of the castings. At the next position toward the right the mold face is blown clean, then it comes before the acetylene flame, seen directly under the hood. Here the mold face is smoked, the excess smoke being drawn away with the products of combustion. The molds are now wide open and at the extreme right of the table three molds can be seen fully open for inspection and the setting of cores. The cycle then repeats itself.

Fig. 2 shows the molds more plainly and also there is placed in the foreground a set each of a one- and a two-casting mold. The arrangement for pouring basin, core vents and gating is plainly shown. A core has been set in the third mold from the left. The holes in the molds directly in the spaces for the molten metal are filled with suitable pins which push inward as the molds open and thus eject the castings automatically.

Fig. 3 shows some of the castings as ejected from the molds and partly machined; also a broken casting with perfectly uniform fine-grained fracture, easily machinable and without a sign of chilling. The piston castings shows some thick sections, not being cored for the pin. The pair of castings connected with the gate, at the extreme right, are interesting as being taken from the right-hand mold pair of Fig. 2. The cores have been removed.

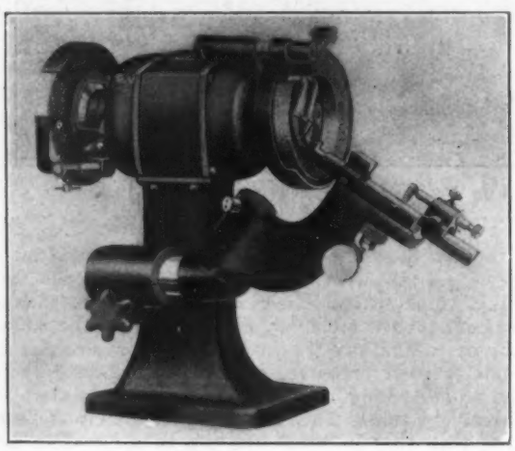
Fig. 4 shows two of the tables in operation. Pouring off may be observed on the first table and the smoking of the molds on the first and second. Successful results have also been obtained by spraying the molds with a film of graphite in oil, the heat of the molds driving off the oil almost immediately. This method would doubtless be more economical for larger molds.

It has been of great interest to the writer to observe the operation of the Holley development. For many years he has advocated leaving the "permanent mold" idea in favor of the "long-life mold," as giving promise of better results, if not as spectacular. The principles involved have also been discussed by the writer, but until the Holley Carburetor Co. had worked out the problem step by step and had provided for the several contingencies mentioned in connection with the requirements of the mold surface, nothing comprehensive in this line had come before the foundry industry. It is with genuine pleasure, therefore, that there has been given as the title of this paper the words, "A New Long-Life Mold Development."

Motor-Driven Twist Drill Grinder

A motor-driven twist drill grinder in two types for drills from No. 52 to 1½ in. has been placed on the market by the Gallmeyer & Livingston Co., Grand Rapids, Mich.

The machine illustrated is the A-7-T type with a capacity for drills from No. 52 to ¾ in. The same machine with a drill holder having a capacity for drills



Motor-Driven Twist Drill Grinder. Motor bearings are of special design and are adjustable for either radial or end wear

from ⅛ to 1½ in. is designated style B-7-T. The machines are equipped with a ½-hp. motor, either alternating or direct current, and may be driven from the lighting circuit or a power line.

In general design the new machines are similar to those of the company's predecessor, the Grand Rapids Grinding Machine Co. A diamond truing device and diamond for dressing the wheel are provided as part of the standard equipment. This device is designed also to place the holder automatically in correct relationship with the grinding wheel, so that it is close enough to give the correct grind to the drills, and a stop is provided to obviate bumping the front of the holder into the grinding wheel. Motor bearings are of special design and provide for convenient adjustment for taking up either radial or end wear, and thus eliminate end play which would be detrimental in a machine of this type. The swivel bearings are of the bronze bushed type and turn on a ground steel stud, dust being eliminated and adequate lubrication provided.

A smaller machine of this type, taking drills from No. 60 wire gage up to ⅜ in. and driven by a ¼-hp. motor, is in progress of development.

New Iron-Nickel Alloy for Electrical Use

WASHINGTON, April 24.—An alloy of iron and nickel which, it is claimed, is likely to have important uses in various branches of electrical work, was described by H. D. Arnold and G. W. Elmen in a paper presented at the meeting of the American Physical Society at the Bureau of Standards, April 20 and 21. This alloy, known as Permalloy, has recently been developed in the research laboratories of the American Telephone & Telegraph Co., and the Western Electric Co.

The permeability of this new alloy, it was stated, is much greater than that of the best magnet iron. It is being tried in a new submarine cable and is expected to increase the speed of sending with the cable four times. It also has valuable uses in telephone and radio transformers and induction coils. In addition to its high permeability, it has a small hysteresis loss.

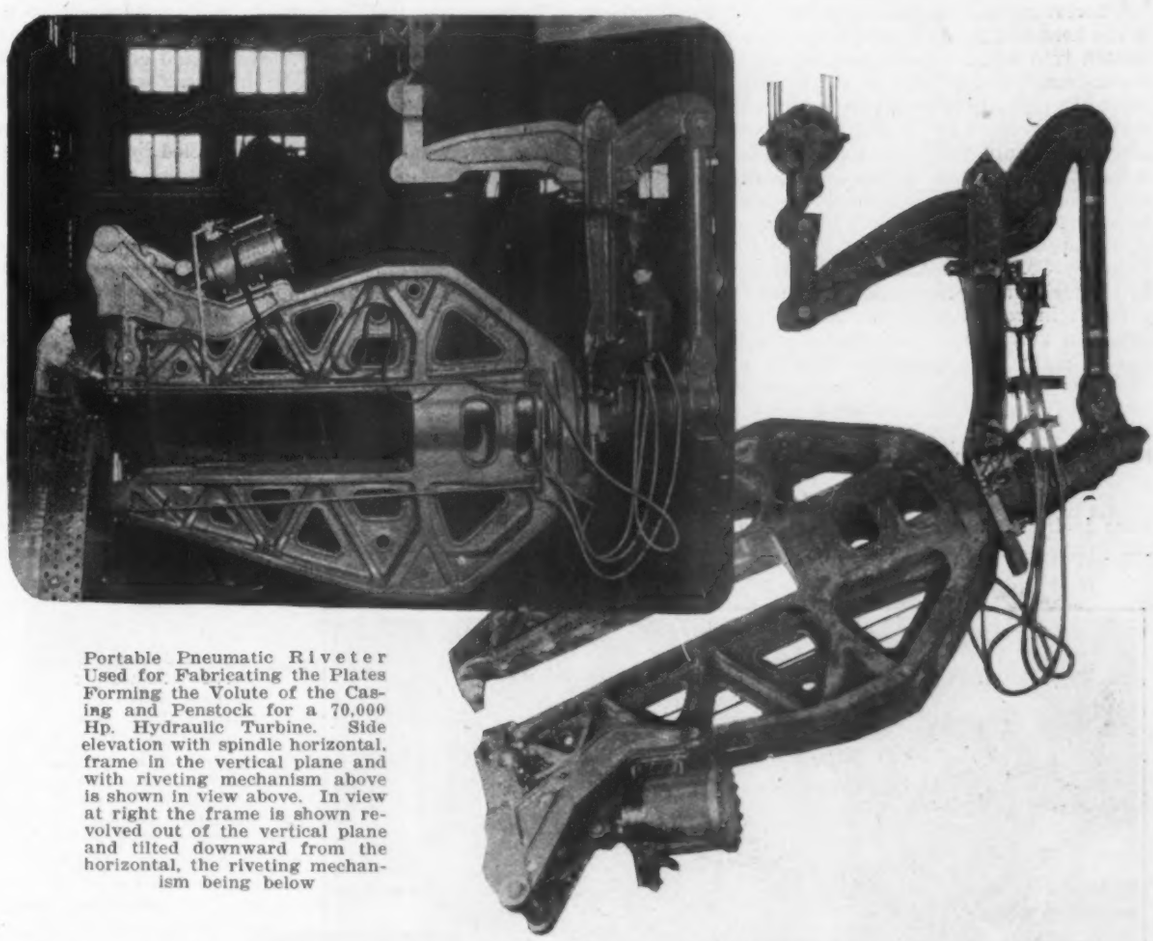
The electrical resistance is found to vary with the strength of the magnetic field in which the alloy is placed, so that a difference, amounting to 0.3 per cent, is caused by the earth's magnetic field, the resistance being different in the east and west position from what it is in the north and south. Its electric and magnetic properties are also changed by applying a load to it.

LARGE PORTABLE RIVETER

Machine for Fabricating Plates Forming Volute of Casing and Penstock for Hydraulic Turbine

The 150-ton portable pneumatic riveter of 118-in. reach and 30-in. gap, illustrated, which is believed to be the heaviest portable machine in use, is employed by the Niagara Falls Power Co., for fabricating the plates forming the volute of the casing, spiral, and penstock for a 70,000-hp. hydraulic turbine.

Something of the magnitude of the operation may be appreciated from the fact that the greatest distance across the volute is approximately 48 ft. and the diameter of the entrance for water is 15 ft. The plates vary in thickness from 1¼ in. at the entrance of the volute to ⅞ in. at the end, with rivets 1½ to 1 in. in diameter and 7800 in number. The penstock is approximately 18 ft. in diameter with plates 1½ in. thick and about 110 ft. long. Three of these penstocks are to be riveted. The volute and penstock are to hold water under a pulsating pressure of about 110 lb. per sq. in., and the work must therefore be of boiler quality.



Portable Pneumatic Riveter Used for Fabricating the Plates Forming the Volute of the Casing and Penstock for a 70,000 Hp. Hydraulic Turbine. Side elevation with spindle horizontal, frame in the vertical plane and with riveting mechanism above is shown in view above. In view at right the frame is shown revolved out of the vertical plane and tilted downward from the horizontal, the riveting mechanism being below

The machine was built by the Hanna Engineering Works, Chicago. The portable weight of the riveter is 57,750 lb. and the weight of the frame, a one-piece steel casting, without spindle or riveting mechanism, is 33000 lb. In addition to the great weight of the machine, the form of suspension, which is almost completely universal, is of interest.

It is obvious that mechanical power is necessary to move the machine into the operating positions. The supporting mechanism is designed so that when revolving the frame on the spindle or tilting it upward or downward from horizontal, the center of gravity of all the parts hanging upon the crane hook is neither raised nor lowered. This is accomplished by the suspension beam at the top, the two vertical links, the spindle housing and spindle, which form a parallelogram with overhung support at the crane hook directly above the center of gravity of the entire machine. With this arrangement it is intended that the friction of the bearings and the inertia effects are the only forces to be overcome.

Revolving and tilting are accomplished by means of two Chicago Pneumatic Tool Co.'s reversible close-quarter air drill motors of approximately 2 hp. each. The motor for tilting is mounted upon the inner vertical or tension link and drives a worm gear which engages with a worm gear sector upon the suspension beam. Tilting motion is limited to 30 deg. below the horizontal. The motor for rotating is mounted upon the spindle housing and drives a full worm gear upon the frame. The frame may be set at any angle around the spindle. A device to absorb the shock of stopping the massive frame is incorporated in the drive.

To minimize the power necessary to set the frame into position, roller and ball bearings are provided at all points of rotation. The frame is mounted upon the spindle by two radial roller bearings and is restrained from longitudinal motion on the spindle by roller thrust bearings. Four roller bearings, one at each end of the vertical links, and two large ball bearings at the crane hook end of the suspension beam, come into action when tilting the frame. A load of approximately 150,000 lb. is carried on the roller bearings on the inner vertical link. Lubrication is by oil bath and positive pressure grease system. Moving parts are fully protected from the elements.

The riveting mechanism is a combination of toggles which merge into a lever action, and is designed to develop a predetermined maximum uniform pressure during the lever action, which is the last half of piston stroke, or what amounts to the last 1 in. of die travel. This is intended to assure the driving of tight rivets with each stroke of the piston, without the necessity of adjustment of the die screw to overcome variation in length of rivets, thickness of plates and other irregularities. Accurate adjustment of the die screw being unnecessary, particular skill on the part of the operator is obviated.

Other features of the machine include the demountable head or rivet driving mechanism and the movable

buck-up or dead die. Engaging sets of crown cams, one set upon the die and one upon the frame, serve to raise the die when the die is given a motion of rotation through 60 deg. When in this position, the die is supported upon flat surfaces, normal to its axis. The design of the frame is also a feature. The truss or continuous beam form with open webs is employed to simplify the casting, continuous surfaces with resulting cooling strains being obviated. With this form, also, stress conditions under service are said to be more definitely determined, and hence the material more advantageously proportioned and located.

The machine is manipulated from one position at the head or dies by means of the three valve operating handles provided for riveting, rotating and tilting. A seat is provided near the rear of the machine, as shown, from which the rotating and tilting motor valves may be manipulated when operating conditions make this point of control desirable. In this case the standard reversing valves built into the motors are utilized.

Heat Treatment of Centrifugally Cast Iron Pipe

Oil Burning Furnace for Annealing—Pipe Pass Automatically Through It Under Close Temperature Control

ONE of the necessary steps in the process of manufacturing cast iron pipe by the centrifugal process is the heat treatment to which they are subjected. The molten iron being thrown against a rapidly revolving water-cooled metal mold is more or less chilled and, when the pipe are removed from the machines, they are more or less hard and brittle. This condition is one of the essential differences between pipe made by the centrifugal process and that made by the older method of casting in sand. Pipe made in sand molds do not have to be heat treated.

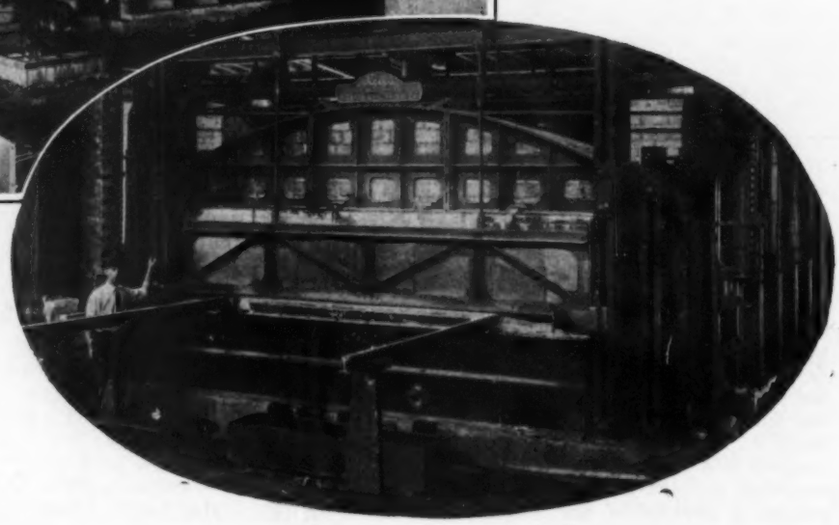
At the plant of the United States Cast Iron Pipe & Foundry Co., Birmingham, the production of iron pipe by the DeLavaud process has assumed fairly large proportions in recent months. The four centrifugal machines or units, which were installed last year, are producing daily large quantities of pipe of various sizes. The undertaking has been sufficiently successful to warrant installing six additional units and several improvements in the process, some of them quite radical, have been made by the engineering staff of the company.

When the first four machines for producing the pipe were installed, the problem of the heat treatment of the product immediately arose and its solution had to be worked out. After considerable experimenting, a furnace was installed which, it is understood, is successful in transforming the pipe as it comes from the machine into the proper softness and crystalline structure necessary for its use in actual service. The accompanying photographs show one of the furnaces which is used at the Birmingham plant for heat treating DeLavaud pipe. It was installed by F. J. Ryan & Co., Philadelphia, and operates upon the Mircs oil burning principle.

The furnace is oil fired with the standard low pressure burners used in the system referred to. There are two chambers to the furnace, the principal heating chamber and the cooling chamber divided by a suspended flat arch. It is stated that there is no difficulty experienced in controlling the temperatures within the heating chamber of from 10 to 15 deg. Fahr., and that no automatic burner control is necessary to secure this regulation.

The temperature is under control through a six-point pyrometer recording instrument and the limit stated is a cross section of the six pyrometer readings, showing that a very uniform temperature is possible. This control is necessary because the least increase above the safety factor would cause the pipe to col-

Entering at the Oil-Fired End of This Annealing Furnace, the DeLavaud Pipe Are Automatically Carried to the Rail Supports at the Left End, Where They Pass on to the Tar Vats for Dipping While Still Hot



The Centrifugally Cast Pipe Enter at This End of the Annealing Furnace

lapse, while lowering of the temperature would produce a defective pipe because of the non-elimination of the chill or hardness.

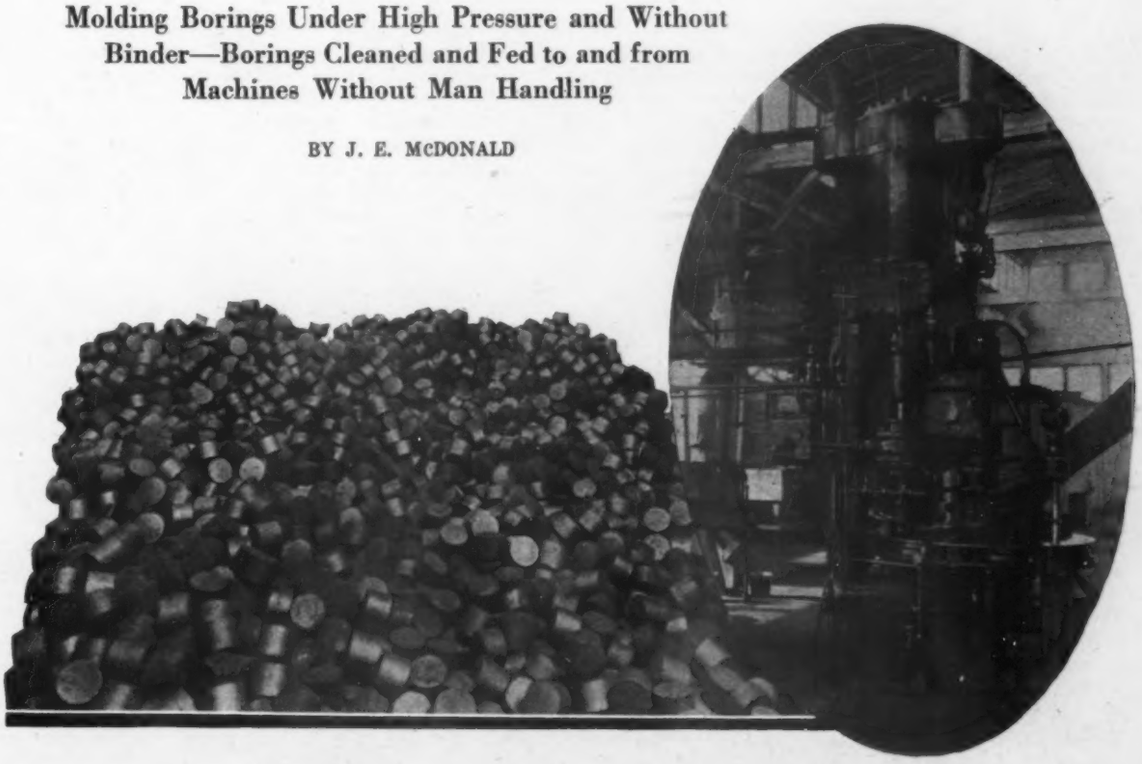
The pipe goes through the furnace automatically and is also kept continually in rotation. To accomplish this the adjustments for control must be close as the pipes are supported at only two points with very small dimensions at the point of support. The furnace is capable of taking miscellaneous sizes of pipe, either hot or cold, and production records are reported to show over 88 per cent of the pipe perfectly annealed. The statement is also made that the cost of operation is 50c. per ton on the hot pipe and below 70c. per ton on the cold pipe.

In the regular course of producing these pipe, the annealing furnace usually receives them in the hot condition or right after they have been removed from the centrifugal casting machine. At present, two heat-treating units are taking care of the output of the four DeLavaud machines now operating at Birmingham and an additional furnace has been installed at the works of the National Cast Iron Pipe & Foundry Co., Birmingham, in whose plant the DeLavaud process is also to be used.

Plant for Production of Cast Iron Briquets

Molding Borings Under High Pressure and Without Binder—Borings Cleaned and Fed to and from Machines Without Man Handling

BY J. E. McDONALD



THE briquetting of cast iron borings has been developed to a considerable extent in Europe, but within the past ten years rapid strides have been made in this country. In this movement the Briquetting Co. of Illinois, with headquarters at Cincinnati, in developing a briquetting machine giving a pressure of 120,000 lb. per sq. in., and having rated capacity of 5 tons of briquets per hour, has been conspicuous.

The price paid for cast iron scrap in this country generally runs considerably above the price of cast iron borings, and this spread is due largely to the greater losses, particularly with fine borings, that take place during melting in the cupola, and also to the considerable loss of iron as iron oxide in the slag. In loose cast iron borings, a total loss of 50 per cent is not uncommonly provided for. Using cast iron boring briquets the loss is put at 8 to 10 per cent when melted alone, and only about 4 per cent when fused with pig iron in the proportion of 80 parts pig iron to 20 parts briquets. When pig iron is melted alone the melting loss varies from 3 to 5 per cent, according to G. Franke, in "A Handbook of Briquetting."

The briquets manufactured by the Briquetting Co. of Illinois, due to the denseness resulting from the high pressure employed, showed, over a series of tests, a melting loss of between 4 and 5 per cent when the cupola was charged with 100 per cent of briquets.

Tests made in Europe, and referred to by Mr. Franke in his handbook, are claimed to have proved that cast iron boring briquets yield notably good castings, particularly from the point of view of density, toughness and strength. Mr. Franke's explanation of the mode of action of the briquets is as follows: "All materials added to an iron mixture to reduce the total carbon by virtue of their own low carbon content do not appear in practice to have the desired results, since they absorb carbon again during fusion. With cast iron briquets, however, the reverse is the case. Compared with loose cast iron borings, the compact form of the briquet protects the materials against strong oxidation in the furnace and against slagging off. At the same time the structure is loose compared with a mass of pig iron, so that the graphite present in the briquet is burned off just above the fusion zone. The subsequent carbonizing process occurring during the period of fusion cannot quite replace the carbon lost in this way, the net result, therefore, being a considerable reduction in the total carbon."

Many attempts have been made to charge borings into the cupola in a manner to prevent oxidation and burning up of the loose borings and to prevent the blast in the cupola from blowing out the finer particles with resultant heavy loss in metal. One of these was to put the borings in sealed wooden boxes, and place them into the cupola. Another was to put the borings into a length of stove pipe with crimped ends, while a third was to cement the borings together in small rectangular boxes. These boxes, or molds, were then set out to harden. When hard the borings were removed from the boxes in the form of a brick. The borings were

actually oxidized before being put into the cupola, due to the moisture in the cementing process. Even if they had held together in the upper zones of the cupola, it is likely that they would go to pieces as soon as they reached the heat zone, by reason of the cement cracking.

Different types of briquetting machines have been developed to briquet cast iron borings both with and without binders. These are included in two general classifications, toggle presses and hydraulic presses. Toggle presses for the purpose of briquetting cast iron borings, without a binder, and to produce a briquet that would be satisfactory in the American markets—that is, a briquet that could be handled by conveying machinery directly from the press, and could stand the rough handling it would certainly receive in shipping from the manufacturer to the foundry, and in the foundry—would develop great stresses in the machinery to get the high pressure desirable.

The hydraulic machine is, in the writer's opinion, the logical machine to produce high pressures, but usually hydraulic machinery must be moved slowly but in the case of briquetting on a commercial scale for the American market it is necessary to have a high speed automatic machine capable of exerting high pressure and producing briquets on a tonnage basis without the use of a binder.

Such a machine has been developed and has been in commercial operation for several years at the Cincinnati plant of the Briquetting Co. of Illinois. The machine is a high speed vertical steam hydraulic briquetting press, making 30 strokes per minute, and exerting 120,000 lb. per sq. in. pressure on the briquet, as stated. It produces a briquet that has a density, it is said, about the same as a solid piece of low carbon cast iron. The machine has a horizontal rotary table with six dies, and is loaded automatically from a hopper. The borings fall into the dies as they come under the hopper. The pressing operation can only be performed when the die, loaded with iron borings, is properly registered under the punch. Each time a briquet is formed, a completed one is pushed out upon a conveyor, which carries the briquet to the storage pile or to a railroad car for shipment.

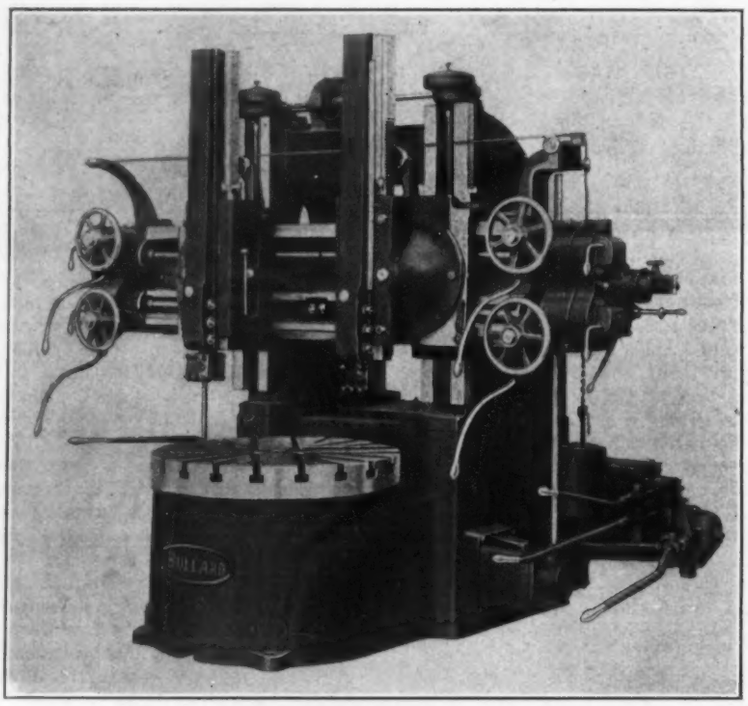
The borings are unloaded directly from cars to a conveying machine, which carries them through a cleaning system consisting of screens and blowers. The screens remove the coarser dirt and the blowers remove the fine dust usually swept up with the borings from machine shop floors. The clean borings are then conveyed directly to the feeding hoppers, or to stock piles, as the case may be. As the plant is entirely automatic, a minimum of labor is employed, the force consisting of one engineer and three to four laborers.

The company operates under two plans. For plants having both foundries and machine shops the company will clean and briquet their borings, making a conversion charge for the service. The company also buys borings in the open market, briquets them and sells the finished product.

Hand Feed Levers on Bullard Machines

Levers for hand feed in heavy cutting are a new feature of the Maxi-mill boring and turning machines of the Bullard Machine Tool Co., Bridgeport, Conn.

A machine equipped with the new feature is shown in the accompanying illustration. The length of the lever is intended to permit of greater leverage in feeding the tool into the work and also to permit the operator to stand in position to observe the cut closely. This in turn is intended to permit of increased production and greater accuracy in fields of work where hand feed in heavy cutting is essential. As example of its advantages the makers cite its use in the machining of automobile tire molds, where it is standard practice to rough out the form by hand feed. By using the hand feed levers the operator may stand in position to observe the cut closely and the greater leverage provided is of advantage in holding the tool to the work against the tough scale and into the chilled cast iron or steel. When the method of form templet and pointer attached to the tool slide is used, the levers permit of watching this closely, guiding the cutting tool with unusual ease and accuracy.



Boring and Turning Equipped With Levers for Hand Feed In Heavy Cutting Operations

The hand feed lever is pivoted on a free swinging collar mounted on the hammer handwheel supporting bracket. Hardened steel clutch teeth on the hub of the handwheel and on the lever are engaged by forward movement of the lever. When not held in engagement the lever automatically drops out of engagement.

Coal companies, known as the John H. Jones properties, have been merged into a single unit to be known as the Bertha-Consumers Co. The new company, which is capitalized for $10,000,000, controls approximately 40,000 acres of coal land with annual capacity of about 6,000,000 tons. Mines of the company are located at Dinsmore and Wilson, Pa.; Downs, Randall, Louise, Moundsville and Dana, W. Va.; Brilliant, Rayland and Nelsonville, Ohio, and Dalna and Blackeye, Ky. General offices are in Pittsburgh and John H. Jones is president of the new company, as he was of all the companies embraced by the merger. In the development of the properties, Mr. Jones has successfully employed the method of enlisting industrial consumers of coal as stockholders.

The Westco Pump Co., Davenport, Iowa, shallow well pumps, has purchased the Chippewa Pump Co., Chippewa Falls, Wis., which makes deep well pumps

Machine Tool Situation in Germany

Effect Produced by Ruhr Occupation—Drawing Raw Material from Abroad—Increase in Production Cost—German Market May Look to America

BY CAPT. GODFREY L. CARDEN

THE general machine tool situation in Germany, as it has presented itself to me in the past two months, has been radically affected by the French occupation of the Ruhr. This view is borne out in talks with the directors of many of the leading works in the Rhineland. It has also been attested by the heads of the machine-tool industries for all Germany.

I should say that the Rhenish shops have felt the Ruhr occupancy more than the Berlin and Chemnitz works. The latter are able to draw on Czecho-Slovakia and are doing so. The cost of importation of steel and iron is showing up in the cost of production, and the added price which the machine-tool works must put on is threatening the foothold lately secured in the export field.

CAPTAIN CARDEN left the United States for Europe in January and visited Germany, France, Austria and Czecho-Slovakia, investigating the industrial situation, in many cases going to works which he visited before the war as Commissioner of the Department of Commerce. Previous articles in this series of special contributions to THE IRON AGE *dealt with "The Present Plight of German Shipbuilding" (Feb. 15), "Today's Products of the Krupp Works" (March 15), the well-known engineering plant of Haniel & Lueg at Düsseldorf, Germany (March 29), "French Trade in American Machine Tools" (April 5), and the "Schiess Machine Tool Works of Düsseldorf" (April 19).*

The Rhenish shops are unable at this time to give any guarantees as to delivery. A number of shops are completing orders which were in hand when the French first arrived. Other shops are working under reduced output for stock. It may be expected that efforts will be made to keep enough work going to hold the organizations together. In the plant of Ernst Schiess, Düsseldorf, advantage is taken of the let-down in orders to carry out plans for expansion. It was the one optimistic note I observed. Everywhere else there was pessimism.

May Yet Buy American Machines

The uncertainties as to deliveries and the added cost for German tools are causing the heads of works which are buyers of machine-tools to look in the direction of the American supply. For the past two years the German market has been virtually closed to American machine-tools. The writer has been assured by directors at German works that the need for the high grade specialized American machine was still recognized, but that the demand was withheld because of the tremendous difference in price between the highly developed American machine and a fairly good German machine of the same type. Germany is now importing coke from the United States—something beyond belief before the Ruhr was occupied. Given consideration in payment terms and the German market, it is declared, may yet turn to the United States for its special tools.

Among German leaders I talked recently with Dr. Walter Negbauer, director general of the German Machine Association, and he summed up the situation by saying that politics and business never go hand in hand. So long as the political situation remains where it is, he feels that the works are helpless. Given freedom of action, he believes all would be well.

In the period shortly preceding the war I reported on the general machine tool situation in Germany for the Department of Commerce at Washington. It was my endeavor at that time to ascertain the relative merits of American and German machines, and if shops were not using American machines to determine the cause for it. Especially was I at pains to inquire what criticisms were leveled at American tools, and in what respects, if any, German machines were excelling.

German Machine Tool Building Reviewed

German works in designing made it a practice to meet the peculiar requirements of the European shops. They did not hesitate to take their dictum from the shop managers. The result was a pot pourri of machines when one considered the conglomeration forming the outputs of not a few works. While such was the general situation then, the German machine-tool makers later learned the advantages of standardization and interchangeability of parts. They have not secured the advantage, however, of attaining a maximum in production. German machine-tool works of today are, with few exceptions, turning out a variety of designs of tools.

In the pre-war competition for business in German territory the usual criticism one heard against American machines included, among other things, the too free use of cast-iron in levers and wheels—the objection being that the German workman was apt to fracture these parts through a habit of throwing his full weight on the machine. There was also complaint that not enough attention was paid to gearings, and that frequently the grade of white metal employed was so cheap that the bearings ran out very quickly. The cost of reboring these bearings for brass bearings was difficult and costly. It was further heard said that there should be less use of cast-iron, especially in tool holders, cams and levers, and if steel was not use wrought iron should be availed of. There was considerable criticism of assembling work, necessitating, it was declared, making good by the purchaser.

Many of the criticisms of American machines were trivial in character, but they served as selling points for those German machines which had been constructed with the errors described largely corrected. The German maker never hesitated to follow American designs, but he added to these designs very frequently some device which proved useful in a German shop. It was a detail of the business that most American builders could not consider. We were building to standard, to meet heavy production demands, and any departure from the steady output flow could not be favorably considered.

The attention paid by the German tool makers to their home industries demands served to give them

business, enabled them to expand, and finally develop along standard lines of their own creation.

Present Belief in Self-Sufficiency

The result has been that the German machine tool industry likes today to regard Germany territory as definitely lost to the American machine tool trade. I have heard within the past few days this view expressed with calm conviction, and the reason ascribed was not because of fault of American machines but because German machines, it was declared, had now attained to the same general excellence of American makes. Simultaneously I was assured by the general manager of one of the greatest works in Germany that the only reason why he did not buy American automatic machine tools was the fact that for the price of one American machine he could under present money valuation secure a half dozen German machines. The latter were not so good for his work as the best American machines but he simply could not justify the American prices.

Demand Mainly for Universal Type

Right now the main demand in Germany is for machine tools of the universal type. The special machine which is limited to one form of production is not yet sufficiently appreciated by the majority of German consumers. The fact that a machine has a large producing capacity has not justified itself forcefully in a territory where workmen are numerous and wages are relatively low.

As an example, there has never been in Germany any great demand for stud lathes, the reason being that these machines are not regarded as sufficiently universal. The German shop man has not changed his ideas since the war with regard to the life of a tool. He does not understand the American practice of getting all possible work out of a machine in a few years, then to scrap it and buy a better one. The German still believes that he should use his machine until it is really fit only for scrap, and that so long as it is usable it does not behoove him to substitute a more up-to-date and productive type. For this reason German machine tools of today continue as heretofore to show more weight than the majority of corresponding American machines, although one hears in shops where American tools are used that the weights of American machines are sufficient.

Shop management in Germany has suffered as a result of the war. There is a lack of the old time discipline. The world war took fully 60 per cent of the machine tool men out of the shops. It has not been possible to replace as yet with experienced men the losses of the war. War requirements used up machine tools in German works at a fearful rate, and with the cessation of hostilities the first thought was to replace the worn out tools. By the end of 1919 much had been accomplished and by 1921 the reconditioning of German shops had been effected to a large degree.

Machine Tool Parts Well Standardized

The main competition which American machine tool builders have experienced in Europe has been in the heavy tool lines, the German builders of planers of 40 ft. and more in length with 4 tool heads, and of vertical forming and milling machines of 37 and more ft. with two tool heads on the cross slide, tool heads on the housing, and under push button control. It is the competition of these large size German machines which our builders have felt, always in the matter of price, seldom in efficiency.

German development in recent years has been nearly along medium machine tool lines. Firms such as Reinecker, Wanderer Works and Biernatski for milling machines, Pitler for turret lathes, Ludwig Loewe and Wotan Worke for general lines Schaerer of Karlsruhe, Wohlenberg of Hanover, Heidenreich and Harbeck of Hamburg for drilling machines, are all names of leading German makes of today. All machine tool parts are now standardized by the German Engineering Association and every effort is being made further to extend and consolidate machine tool construction.

In Germany as in America one will find factories of the first, second and third classes, so that it is not correct to base an opinion on German outputs except with reference to the leading works. The reason for existing differences is the same as in America, since the requirements of consumers never will be uniform. A factory for agricultural implements can generally do with tools of less precision than a high grade motor building works. In general the German machine tool types of today are based on the use of high-speed tool steel.

Export Prices About Same as Pre-War Gold Basis

In regard to the prices charged for German machine tools, the German makers say that this subject is not understood in America if prices are judged by the published reports. German mark prices, it is pointed out, must necessarily be obsolete when weeks later they are published in America. On account of the deterioration of the German currency prices, as one machine tool man put it, are rising from month to month, week to week, and then from day to day.

My informant pointed out that the value of the German currency at home cannot drop at the same speed as its international valuation, consequently all the prices asked for the home market if transformed into dollars or gold (pre-war) marks are considerably lower than corresponding foreign prices.

Roughly, declared the same informant, the paper mark prices are about 70 per cent of the pre-war prices. This is no drop in prices for the German customer, but on the contrary is a severe rise in relation to his purchasing power.

For the German export a system of minimum prices has been devised whereby the export prices calculated in sound foreign currency, such as dollars, pounds and Dutch florins, are about equal to the pre-war gold mark prices. An export license is not granted if at least these prices are not obtained. Any rise in prices independent from the money deterioration is not considered in these minimum prices.

Depressing Prospect

In a recent talk with Dr. Legers of Remscheid, representing the German tool industry in that region, that gentleman said that the prospects ahead spelled hard times, unemployment and a total lack of capital. No issue is possible, he declared, until there is a definite settlement of differences with France so far as relates to the war debts. This must be, he continued, otherwise not alone Germany but economic life elsewhere will suffer. We are not sure of anything now, he added, and while we have no security, no freedom, we are unable to work. The position is very difficult and we are all very depressed.

The German machine tool industry comprises three main groups, Rhine, Berlin and Chemnitz, with lesser groups in Bavaria and in the vicinity of Frankfort. Cut out the Rhine group and there are still left important groups elsewhere in Germany. These latter must draw largely on outside sources. The steel works in Czecho-Slovakia will be able to furnish much of what is needed, and the effect of the Ruhr occupation has been to place orders with the steel foundries to the southward. This importing of raw material, however, cannot be kept up with any advantage. It may enable some of the eastern groups to carry through their present commitments, but the effect on future prices is obvious.

Progress in Welding Arts Reviewed

Developments Summarized and Research Planned at Welding Society Meeting—Course of Training for Welders Completed—Program Comprehensive

WELDING in all its phases was discussed at the annual meeting of the American Welding Society which was held at the Engineering Societies Building, New York, April 24 to 27.

Committee meetings occupied the first day. Courses for the training of both gas and electric welders were taken up by a committee headed by J. C. Wright, the plan for a training course for oxy-acetylene welders completed. A similar course is being prepared for electric welding. Progress reports were made by subcommittees on standardization of arc welding apparatus, applications of arc welding to ship construction, and cast iron welding. An investigation has been started on the arc welding of non-ferrous metals by the electric arc welding committee, which is headed by H. M. Hobart, consulting engineer, General Electric Co., Schenectady, N. Y. This committee is compiling data on the speed of welding, which investigation includes data on the effects of current values of different electrodes and of varying technique of welding. The welding of thin sheet metal with the metallic arc and an investigation of structural arc welded joints come also within the activities of this committee. The last named investigation will cover the effect of different commercial electrodes, current values, sizes of plates and positions of welding and test specimens, similar to those used by E. S. Humphreys, Jr., and described in THE IRON AGE of May 25, 1922, page 1422, are to be used.

Revision of existing specifications on the welding of storage tanks was discussed at a meeting of the committee, of which J. C. Lincoln, Lincoln Electric Co., Cleveland, is chairman. Specifications for the electric and oxy-acetylene welding of a tank 40 to 50 ft. in diameter and 25 ft. high have been completed. A meeting of the resistance welding committee, of which H. Lemp, General Electric Co., Erie, Pa., is chairman, was also held.

New Officers

T. F. Barton, master mechanic, Delaware, Lackawanna & Western Railroad, is the new president of the society. A. B. Thompson, General Electric Co., San Francisco, was elected vice-president, representing the Pacific Coast, and C. W. Jones, Westinghouse Electric & Mfg. Co., Atlanta, vice-president, representing the Southern division. Directors elected include A. M. Candy, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; H. S. Smith, Prest-O-Lite Co., Inc., New York, and Dr. C. A. Adams, New York. C. J. Holsag was re-elected as director.

The society begins its fifth year with 684 members, according to the report of the membership committee. Two local sections have been added during the year, making nine in all, and two more will be added within the next few months.

Developments in Welding Field in 1922

A summary of the new developments in the welding field, covering electric arc, gas, resistance and thermit welding, was part of the program of the business meeting. A paper on "Recent Developments in the Arc Welding Field," read by W. L. Warner, General Electric Co., Schenectady, reviewed the work that has been done under the auspices of the American Bureau of Welding, which is the welding research department of the American Welding Society. Standardization activities, which included standard tests for welds and welding wire specifications, were outlined and also the general reports and research work of the bureau. The latter included material on the arc welding of cast iron, specifications for steel to be welded, unfired pressure vessels, the welding of oil storage tanks, and welded rail joints. In addition to the work of the bureau some interesting applications of the welding process brought out in independent investigations were given.

Hammer forging was named as highly valued for improving the strength, ductility and fatigue resistance of metal deposited by the electric arc. Welding currents of 200 amp. are not unusual today, it was pointed out, although 125 amp. was in most common use only a few years ago. For large thermal capacities, 300 amp. is sometimes used with coated electrodes. "This type of electrode," said Mr. Warner, "has been very much improved and appears likely to lead to the arc welding of non-ferrous metals. The arc welding of brass with a flux-covered type of copper electrode is already commercial in England."

The supervision and training of welders as an essential factor in the successful application of welding was emphasized. Progress was reported in the field of locomotive construction and repair, and in the maintenance of street railroads electric arc welding was outstanding in playing an important part, truck frames, motor frames, gear cases, and other parts being economically reclaimed. Although it is possible and often necessary to weld malleable iron, it was pointed out that the welds do not have sufficient strength to justify this application on a large scale.

While there have been no radical changes in arc welding processes employed in steel mills within the year, it was said that there are indications that welding will be advantageously used in an increasing number of applications. The repair of worn wobblers, formerly accomplished by the carbon arc process, is being replaced by the metallic arc, with which ¼, ⅜ and ½ in. diameter electrodes are used, the current values varying from 300 to 800 amp. The use of the large electrodes and heavy current values is similar to the carbon arc process in that rapid deposition of the metal is accomplished. The use of the metallic arc was said to have the advantage over the carbon process in that a less skillful operator can produce reliable welds. A departure noted from the practice of using iron electrodes for the building up of worn wobblers and spindles is that of the use of high carbon steel. In all cases the metallic arc was used. The use of the electric arc in the repair of all kinds of machinery used in steel mills was said to have been found economical.

The arc welding of storage tanks, and the application of arc welding to the joints of pipe lines and in building of steel structures were briefly reviewed. The arc welding of monel metal was said to be possible when the proper reducing flux is used, in which case the process is not essentially different from that of steel welding. The welding rod, however, is made positive instead of the work, and it is best to build up the weld in one operation and not in successive layers.

In a section on arc welding apparatus, Mr. Warner referred to development of a safety switch which cuts the power from the welding line and primary circuit whenever the arc is not being drawn. This device he characterized as one of the notable achievements of the year in the field of alternating current arc welding apparatus. The voltage at all times during welding is limited to a harmless value such as 30 volts.

Pipe Line of 140 Miles Without Couplings

The welding of steel pipe in long stretches was emphasized as an outstanding feature of the year by G. O. Carter, consulting engineer, Linde Air Products Co., New York, whose paper was on the "Oxy-Acetylene Processes in 1922." Details were given on the 140-mile line of 8-in. pipe welded by the Prairie Pipe Line

(*Continued on page* 1304)

AUTOMATIC DOUBLE GRINDER

Offset Mounting of Wheel Spindles a Feature—Rapid Production and Unusual Accuracy Claimed

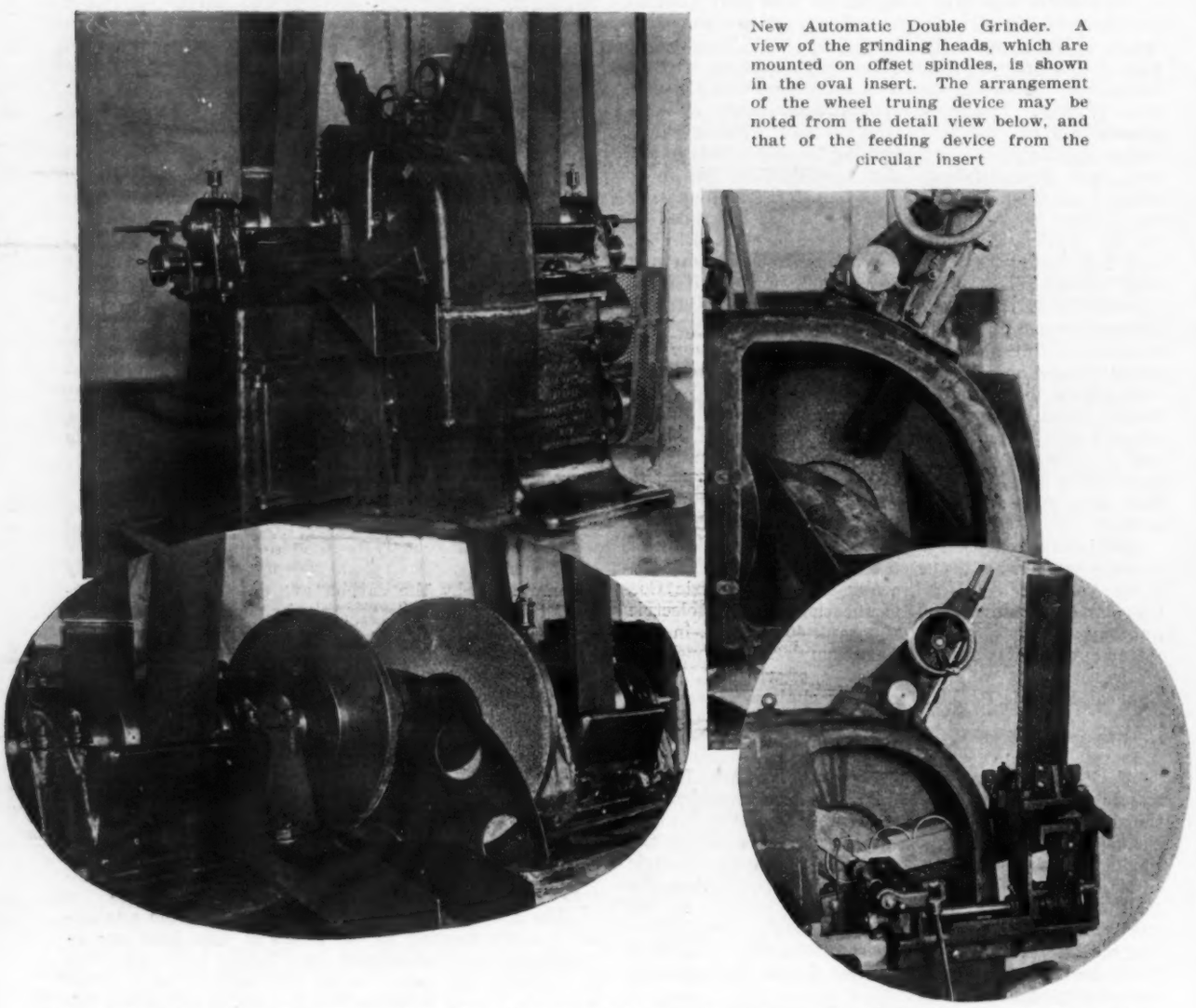
The Gardner Machine Co., Beloit, Wis., has added to its line the machine illustrated, designated as the No. 2 automatic double grinder. It is designed for the rapid production of parts having two opposite parallel sides of approximately equal area, such as piston rings, ball and roller bearing races and thrust washers. A similar machine of larger size, with 24-in. wheels, was described in THE IRON AGE of Jan. 12, 1922. Greater production than obtained by hand-operated disk grinders and unusual accuracy are claimed.

A feature of these machines is the offset mounting of the wheel spindle heads. The grinding operation is performed on the back face of one wheel and the front face of the other. This arrangement of the heads is intended to permit of quick use of the integral wheel dressers without changing the set-up of the grinding members. It also causes the piece to revolve rapidly during the grinding, which is said to result in much greater accuracy than if the pieces were held rigidly and not permitted to rotate. Provision is made for maintaining the alignment of the machine heads through adjustment of the stationary head.

For dry grinding 18-in. steel disk wheels faced with the company's improved abrasive are employed. When coolant is used the grinding members consist of 18-in. abrasive ring wheels carried in chucks.

The work is carried between the grinding members on a work carrier which has a feed range from 15 to 60 pieces per min. It is thus possible to accommodate a variety of work sizes having different amounts of stock to remove. A feed range of 4 to 15 pieces per min. may be had by changing a pulley on the countershaft. Rigidity of the work carrier is a feature.

The work carrier has a number of openings, from 6 to 12, to receive the work. These may be made to conform to a variety of shapes by means of inserts, one carrier serving for several sizes of similar parts. Special carriers are available which the operator loads and unloads as the work is ground, and in this way the machine becomes semi-automatic in operation. As the work approaches the grinding position, one of the grinding members automatically advances until it reaches a positive stop, as in the previous machine. This member approaches the work under an adjustable spring pressure governed by a cam, and it advances only as rapidly as the stock is removed, giving a constant pressure against the work. It is returned to the open position by the action of the same cam, and the work, as it passes out from between the wheels, is unloaded automatically.



New Automatic Double Grinder. A view of the grinding heads, which are mounted on offset spindles, is shown in the oval insert. The arrangement of the wheel truing device may be noted from the detail view below, and that of the feeding device from the circular insert

The general construction of the machine may be noted from the illustrations. The spindles are of alloy heat-treated steel and the spindle bearings of bronze of special design, and adjustable for wear. The thrust is carried by hardened and ground steel collars which bear directly upon the spindle bearing, adjustment for end thrust being provided by a nut and locknut on the spindle at the opposite end of the bearing. Bearings are housed in a way to protect them from dirt or dust and adequate lubrication is provided.

The grinding heads are mounted upon sub-bases upon which they may be adjusted by means of a handwheel operating through a screw. The handwheel is graduated to 0.001 in. and permits adjustment of the grinding members to compensate for wear of disks or

ring wheels. When a greater distance is desired between the grinding members than the screw adjustment will permit, the sub-bases may be adjusted also along the main base of the machine.

A backing plate is provided to fill the center holes of each grinding wheel, which prevents work falling into these openings. These plates are integral with the hollow shafts which pass through the machine spindles and are arranged so that no adjustment is necessary after the first set-up is made. Each grinding member is supported by the entire head, and flanges carrying them are of larger diameter than on standard disk grinders. A cast iron hood is provided, as shown, to guard the grinding members, which with the standard shields when attached to an exhaust system, provides means for removing abrasive dust.

When dressing wheels production need not necessarily be stopped. The dressers are mounted upon rigid slides carried by the heavy cast iron hood, and when operating travel in a vertical slide and are operated by a handwheel working through a rack and pinion.

A feature of the machine is the method used for introducing the coolant at the proper point. A tube for carrying the coolant passes through the entire length of each of the hollow spindles, connection being made at the outer end with the pump and the inner end terminating in the backing plate described. Each tube has a number of holes at a point just behind the backing plate through which the coolant is ejected, thus being presented at the center of the grinding member instead of at the periphery, and assuring proper flushing of the entire face of the wheel as well as properly flooding the work.

An automatic work feeder suitable for delivering certain classes of work to the carrier has been provided. This device presents the work to the carrier mechanically, one piece at a time, so that the last piece in the magazine is sent through just as easily as if the hopper were full. For larger work or for irregularly-shaped pieces hand feed or feeds by a trough arrangement can be easily provided.

The machine is available in belt drive only. The floor space occupied is 4 by 8 ft., the power required for maximum duty is 17 hp., and the weight 4250 lb.

Testing Materials Meeting

Endurance of metals under repeated stresses will be discussed in two papers to be presented at the annual meeting of the American Society for Testing Materials to be held at the Chalfonte-Haddon Hall, Atlantic City, N. J., in the week of June 25. Also a topical discussion is announced on the subject, "Is It Desirable to Include Chemical Requirements in Cast Iron Specifications?", with the affirmative side to be introduced by Robert Job and the negative side by Dr. Richard Moldenke. On account of the number of reports and papers, it has been found necessary to schedule 13 sessions, with the first session on Monday evening, June 25, and the closing session on Friday night.

Officers Nominated

Gwilliaem Aertsen, Midvale Steel Co., Chicago, at present a vice-president, has been nominated president of the society. The other nominations are as follows:

For vice-president, W. H. Fulweiler, chief chemist, United Gas Improvement Co., Philadelphia. For members of executive committee, J. H. Chubb, manager, service bureau, Universal Portland Cement Co., Chicago; T. G. Delbridge, assistant manager, Atlantic Refining Co., Philadelphia; H. L. Scott, Henry L. Scott & Co., Providence, R. I., and P. H. Walker, chemist, U. S. Bureau of Standards, Washington.

The first session, that of Monday evening, June 25, will be devoted to nonferrous metals and alloys. The second session, on the morning of June 26, will cover corrosion, fatigue of metals and magnetic analysis. Wrought and cast iron and heat treatment will be the subjects of the third session, on the afternoon of June 26. The social session, at which will be delivered the presidential address by Dr. George K. Burgess, director of the Bureau of Standards, will be the Tuesday evening meeting as usual. For steel and methods of testing, the fifth session, Wednesday morning, has been reserved.

Besides the main features of the meeting, the consideration of committee reports, the following are among the papers which have been announced:

"Endurance Properties of Steel: Their Relation to Other Physical Properties and to Chemical Composition," by D. J. McAdam, Jr. "Resistance of Manganese Bronze, Duralumin and Electron Metal to Alternating Stresses," by R. R. Moore. "A New Method of Magnetic Inspection," by A. V. de Forest. "Methods of Casting Test Specimens of Gun Metal," by E. H. Dix, Jr. "The Influence of the Ratio of Length to Diameter in Compression Testing of Babbitt Metals," by J. R. Freeman, Jr. "The Properties of Metallurgical Coke," by G. St. J. Perrott and A. C. Fieldner. "The Significance of Tool Temperatures as a Function of the Cutting Resistance of Metals," by H. A. Schwartz and W. W. Flagle. "Gases in Metals," by Louis Jordan. "New Developments in Telemetric Devices," by O. S. Peters and R. S. Johnston. "Optical Strain Gages and Extensometers," by L. B. Tuckerman.

Harvester Company President Sounds Note of Caution

The peak of the metal market has been reached in the opinion of Alexander Legge, president of the International Harvester Co., who addressed members of the Tractor and Thresher Department of the National Association of Farm Equipment Manufacturers at their spring meeting in Chicago April 20. He counseled against a repetition of the character of buying which obtained in 1920, when manufacturers entered the market and bid against each other for materials to fill orders that were to a large extent fictitious, and called attention to the fact that the present shortage of farm machinery may bring with it a duplication of orders which some may possibly mistake for real business unless careful investigation is made.

Production of steel during March, he said, reached a point never before equaled and he asserted that if the present rate of production continues, the supply of metal products should soon catch up with the demand and probably exceed it. This, he emphasized, is of the utmost importance to the farm equipment industry, since a rise in material prices during the last year has constituted one of the greatest obstacles which the industry has been called upon to face. "The implement line is pretty well sold out," he said. "The spring trade is much better than last year, and if it had not been for the runaway material market, we would have reason to believe good trade conditions would remain for some time."

Touching upon the European situation, Mr. Legge asserted that the prosperity of the farm equipment industry depended much upon the ability of the farmers to dispose of their surplus products abroad. "If the situation abroad clears up, it will materially prolong the present prosperous period." He expressed little hope, however, that the European situation would rapidly improve.

American Design for Citroen Foundry

The H. M. Lane Co., foundry engineer, Detroit, has been retained by Andre Citroen, the well known French automobile manufacturer who recently visited the United States, to organize a foundry department for the Citroen works in Paris. In connection with this foundry H. M. Lane and a member of his staff will make a trip to Paris to study the conditions and on their return will design the plant and arrange for the selection of the equipment and its purchase in so far as American equipment is to be used. It is planned to have the new plant in operation in the coming fall.

GENERAL STEEL INQUIRY

Tariff Commission Will Not Stop with Pig Iron and Swiss Files

WASHINGTON, May 1.—Recommendation for a general inquiry into the cost of production of iron and steel in the United States and in the principal producing countries abroad is understood to have been made to the Tariff Commission by its advisory board, of which Paul M. Tyler, head of the iron and steel division, is a member. The recommendation followed a recent meeting of the commission with President Harding, which related to procedure under the flexible provisions. The general inquiry suggested as to iron and steel and other lines would not be confined to authority under these provisions, but would take a much wider survey of the iron and steel situation here and abroad. At the same time recommendations as to changes in rates would be limited entirely to action under the flexible provision. So far the only applications made under this provision as affecting the metal schedule refer to pig iron and Swiss files.

The recommendation just made follows closely proposals that have been considered for some time by the commission, as stated heretofore in THE IRON AGE, but it brings the question nearer to final determination and action is expected soon. This will decide whether the survey will be a broad one or whether it will be confined to studies under the flexible provisions exclusively. It is the feeling of members of the commission, so far as the iron and steel situation is concerned, that there is no urgency in beginning an inquiry abroad while the situation in the Ruhr remains as it is.

Meanwhile the questionnaire regarding pig iron costs has been put into final form and will be submitted to the Tariff Commission for action, which, it is believed, will be taken within 10 days or so. After that is done the questionnaire will be sent to merchant blast furnace operators in the Alabama, Virginia, eastern Pennsylvania and Buffalo districts, and later the same form will be used in studying the pig iron situation abroad. This is being done upon application under the flexible provision of Eastern merchant furnace operators, who are seeking an increase in the present pig iron duty of 75 cents per ton.

The domestic inquiry into costs of making Swiss files also has been completed by Paul Hermes, in charge of the cutlery subdivision of the iron and steel division. This inquiry is to be extended to foreign competing countries. Later a general survey of the cutlery industry is expected to be made. This also will await settlement of the Ruhr situation, inasmuch as Solingen, the great cutlery center of Germany, is greatly affected by the Ruhr occupation.

Domestic makers of cutlery show much interest in the situation in view of the report that both German and English makers are desirous of seeking lower rates. It is believed that importers of German cutlery are especially anxious to get lower rates and may make application under the flexible provision.

Program of American Iron and Steel Institute Meeting

The twenty-third general meeting of the American Iron and Steel Institute will be held at the Hotel Commodore, New York, on Friday, May 25. The program is as follows:

Address of the President, Elbert H. Gary, chairman United States Steel Corporation.

"Value of Chemistry in the Iron and Steel Industry," by W. A. Forbes, United States Steel Corporation, New York.

"Motor Driven Rolling Mills," by H. E. Davis, electrical engineer, Interstate Iron & Steel Co., South Chicago, Ill.

"Standardization of Steel Mill Practice by Time Studies" by Robert Gregg, president Atlantic Steel Co., Atlanta, Ga.

"Gas Producer Practice in Steel Works," by Waldemar Dyrssen, United States Steel Corporation, New York.

"Methods in Waste Elimination," by H. T. Morris, metallurgical engineer, Bethlehem Steel Corporation, Bethlehem, Pa.

"Disintegration of Fire Brick Linings in Blast Furnaces," by C. E. Nesbitt and M. L. Bell, research engineers, Carnegie Steel Co., Pittsburgh.

Longstreth Metal Awarded Swiss Company

The Edward Longstreth medal was awarded April 18 to the Société Genevoise d' Instruments de Physique, Geneva, Switzerland, by the Franklin Institue for the development of a universal measuring machine. R. Y. Ferner, Washington, received the medal on behalf of the Geneva company. The instrument for which the award was given is adapted to measurements of gages and length-measuring equipment used in the machine shop and for checking special pieces for which other measuring equipment is not available.

Patterns, dies, fixtures and machinery for the production of the Ketchum milling and drilling machine vise, formerly manufactured by the Production Tool Equipment Co., Inc., Bridgeport, have been acquired by the Skinner Chuck Co., New Britain, Conn. The Skinner company plans to develop a complete line of milling machine vises, with and without swivel bases.

Mackintosh-Hemphill Co., Pittsburgh, recently was awarded a 4-unit, 30-in. sheet mill with all auxiliary equipment by the Kawasaki Dock Yard Co., Japan. This is a standard sheet mill and substantially a duplicate of the mill built by the company for the Otis Steel Co., Cleveland.

Sloss-Sheffield Company Buys Sheffield Iron Corporation

BIRMINGHAM, April 30.—The Sloss-Sheffield Steel & Iron Co. was the only bidder at a sale by court decree of the properties of the Sheffield Iron Corporation, held at Sheffield, Ala., today. The purchaser bid $265,000 cash and will assume the mortgage and bonded debt of $585,000. The properties include one blast furnace at Sheffield in good condition and ore and coking holdings in Tennessee and Alabama. It is announced that the furnace will resume by the middle of next month, giving the Sloss-Sheffield company seven active stacks, the sixth one to go in within a few days. The purchase will add to Sloss-Sheffield ability to serve the Middle West with river and rail iron at rates appreciably lower than all rail freight.

Reduced Rates on Steel to Pacific Coast

Freight rates on plates, shapes, bars and sheets from Chicago to the Pacific Coast were reduced to $1 per 100 lb., effective April 17. At the same time the all-rail rate from Pittsburgh to the coast was reduced to $1.34, being higher than the rate from Chicago by the exact amount of the freight from Pittsburgh to Chicago. Previously the difference was only 15c. per 100 lb., the rate from Chicago having been $1.35 and that from Pittsburgh $1.50.

By rail and water Pittsburgh still has an advantage of about $5 a ton over Chicago, so that Western mills can compete with Pittsburgh only on such commodities as galvanized and black sheets which are discolored when shipped by water. Even in the case of black sheets, the discoloration is not serious because they are largely fabricated into manufactured products and are pickled in the process.

Puddling Wage Basis Advanced

YOUNGSTOWN, April 30.—The puddling rate for May and June advances to $12.12 per ton from $11.62 as a result of the bi-monthly examination of sales by the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers.

Bar iron shipments for the 60-day period ended April 20 carried an average price of 2.35c. per lb. as compared with a 2.25c. average two months ago. Finishers receive a proportional advance.

CONTENTS

May 3, 1923

New Wire Mill Has Unusual Features 1245
Automatic Coiling and Conveying System—Slow Start for Motor-Driven Wire Blocks—Continuous Wire-Drawing Machines

New Long-Life Mold Development 1251
Refractory Lined Mold With a Cast Iron Backing—The Principles of Its Construction—400 Castings Possible Per Hour

Machine Tool Situation in Germany 1259
Effect Produced by Ruhr Occupation—Drawing Raw Material from Abroad—Increase in Production Cost—German Market May Look to America

Progress in Welding Arts Reviewed 1261
Developments Summarized and Research Planned at Welding Society Meeting—Course of Training for Welders Completed—Program Comprehensive

Notable Foundry Gathering at Cleveland 1269
Pronounced Optimism the Ruling Sentiment—Large Exhibition Facilities Not Equal to Demand—Attendance Large—Technical Sessions of Monday and Tuesday—New Officers

April Pig Iron Production 1274
All Records Broken with Increase of 4500 Tons a Day Over March

Can France and Germany Be Allies in Steel? 1291
The Ruhr Occupation from the Standpoint of French Industry—No Plan for "Destroying" the German Machinery of Production.

Employee Representation Plans at Work 1295
Analysis of Sixteen Kinds in Operation in Cleveland Stresses Sincerity and the Spirit of Cooperation—Outside Arbitration Not a Factor and Not Needed

Oil Grooving Attachment for Lathes... 1250
Improves Mercury Thermometers..... 1250
Alabama War Rates Sustained..... 1250
Coke Rates Suspended..... 1250
Japanese Iron and Steel Production..... 1250
Motor-Driven Twist Drill Grinder..... 1254
New Iron-Nickel Alloy for Electrical Use 1254
Large Portable Riveter..... 1255
Heat Treatment of Centrifugally Cast Iron Pipe..... 1256
Production of Cast Iron Briquets..... 1257
Hand Feed Levers on Bullard Machines.. 1258
Automatic Double Grinder..... 1262
Testing Materials Meeting..... 1263
Harvester Company President Advises Caution 1263
American Design for Citroen Foundry.. 1263
Steel Inquiry by Tariff Commission.... 1264
Program of Institute Meeting..... 1264
Buys Sheffield Iron Corporation..... 1264
Reduced Rates to Pacific Coast..... 1264
Editorials 1266
Prolonging Prosperity—The Youth and the Union—Costs as a Basis for Prices—The Railroads Are Functioning.

Problem of the Labor Shortage..... 1268
New Extras for Steel Sheets..... 1272
Fabricated Steel Business..... 1273
Railroad Equipment Buying..... 1273
To Build Strip Steel Mill in Detroit.... 1284
British Iron and Steel Market..... 1285
To Investigate Apprentice Systems..... 1287
More Men Employed..... 1292
Coke Production Curtailed..... 1292
Important Problems at Washington.... 1293
Present Prosperity Will Soon End.... 1294
Competing for Labor..... 1296
Foot Control Reduces Costs..... 1297
Merger of Axle Plants..... 1297
German Market Activity Less..... 1298
Export Sales Decline..... 1299
Safety Conference 1300
Bridgeport Wage System..... 1300
Canadian Industries Gain Steadily.... 1301
Michigan Manufacturers Meet..... 1301
Refractories Statistics for March..... 1301
A New Radiation Pyrometer..... 1302
Suitability of Welding Steels..... 1303

Iron and Steel Markets 1276
Comparison of Prices 1277
Prices Finished Iron and Steel, f. o. b. Pittsburgh 1286
Prices of Raw Materials, Semi-Finished and Finished Products 1287
Personal Notes 1288
Obituary Notes 1289
Non-Ferrous Metal Market 1290
Machinery Markets and News of the Works 1305
New York Jobbers' Prices 1316

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY WILLIAM W. MACON GEORGE SMART

C. S. BAUR, *General Advertising Manager*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President* PRINTED IN U. S. A. George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Charles G. Phillips, *Vice-Pres.* A. C. Pearson, *Treas.* F. J. Frank, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 410 Unity Building. Philadelphia: 1420-1422 Widener Building. Cleveland: Guardian Building. Detroit: 317 West Fort St. Cincinnati: Mercantile Library Bldg. Buffalo: 833 Ellicott Square. Washington: 26 Jackson Place, N. W. San Francisco: 320 Market St. London, Eng.: 11 Haymarket, S.W.1.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single copy 25 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Prolonging Prosperity

The great increase in production in the United States since the beginning of the revival following the depression of 1921 is made the pivotal fact in the Federal Reserve Board's analysis of the business situation at the end of April. But more significant than the extent of the increase, which the report points out is not less than 67 per cent for 21 basic commodities in the past 18 months, are the results attained in the reduction of cost per unit.

It has not been generally appreciated to what extent plant managers have succeeded in the efforts made in the past two years to increase output per man. So much has been written of the unwillingness of workers to assist in combating rising costs that it has been commonly accepted that the conditions so notoriously prevalent in war time and for two years after the war have continued.

Steel manufacturers know that much has been done in their industry, in the larger use of machinery, in re-analyzing plant problems and in readjusting jobs. Not being able to get as many men as they have had heretofore at open-hearth works and in mill and furnace yards, they have found ways of getting high output with such labor supply as they could get. At the recent annual meeting of the United States Steel Corporation, Chairman Gary said that the efficiency of the men was better than at any period since the war. Thus with nearly 10 per cent fewer men than were employed at the time of peak production in 1920, the Steel Corporation has been getting output up to and even beyond the best attained in that hectic year. Like experiences are reported by various independent producers of steel. Without such increases in unit production it is not pleasant to contemplate what would have happened to steel costs and steel profits.

The Federal Reserve Board points out how prosperity has been advanced by the success of efforts to reduce unit cost, and with what healthful effect upon the credit situation:

> The volume of goods produced and consumed during the first quarter of 1923 probably exceeds that of any similar period in the history of the country. Fuller employment of equipment and of labor has produced the additional income from which profits and wages were realized. *In fact, profits in many lines of industry have been dependent upon quantity production, the lower production cost per unit more than offsetting the increased cost of materials.*
>
> It is partly in consequence of larger output that the prices of manufactured goods have not more fully reflected the increases in prices of raw materials. Larger payrolls also until quite recently have resulted chiefly from increased employment rather than from advances in wage rates.
>
> These increases in production and employment have thus far economically justified the increases in the total volume of bank credit. For credit extension does not result in overexpansion so long as the additional credit yields proportionate results in the larger production and marketing of goods.

Evidence accumulates that the 1920 situation is not paralleled in that of today, and so far as steel is concerned each week testifies to the lessening danger of a runaway market. So many cautions have been sounded that tendencies toward excesses have been checked. And now very definite developments in the building trades, both in the East and the Middle West, indicate that inordinate demands of labor and undue prices for materials are producing their legitimate fruit in the halting of projects of considerable volume. Such news is not unfavorable, but favorable; it prophesies the prolongation of prosperity.

The Youth and the Union

While much is said about the restrictive influence of labor unions upon the supply of artisans in various trades, the mental influence upon the youth of the country of the labor union system as it exists usually receives little consideration. When it is noted that various trades have not been receiving recruits in recent years in adequate number the deficiency is attributed usually to the apprenticeship rules of the various unions.

The practical point is that the psychological influence is very important. The unions may be very serious, but they have been joked about from time immemorial. The suburbanite remarks to his industrious neighbor, "Don't you know the union doesn't allow that?" and so on. Boys as well as men hear of the things "the union" does not allow, of how they strive to make the member a unit, not an individual. He is "one carpenter" or "one bricklayer," not a good worker striving to get along in the world by doing the best he can for himself and his employer. For what he

is and what he gets he must thank the union, not himself.

To the ambitious youth—and what youth is not ambitious—how does this appeal? Perhaps here and there a boy does think: "When I get big I'm going to be a union man!" But if so he has not in him the stuff of which good workmen are made.

The psychology of youth is independence and self sufficiency. The last thought of a boy is that of getting a job in which somebody will take care of him. He will take care of himself, thank you, and what he looks forward to is getting into the field where he will have the biggest and the broadest opportunity. The callings in which there are unions are precisely those that do not offer any such prospect.

It is sometimes remarked that the American boy would rather become a ribbon salesman than a machinist, and the inference is that he simply wants to have clean hands and wear good clothes. But the boy thinks along the line that the machinist is likely always to be a machinist, while the ribbon salesman may become a silk salesman and the silk salesman a silk buyer, who even may be sent abroad to make purchases. The point may be pressed further, that the average labor union does not view with complacency efforts on the part of the employer to improve the workman's surroundings and working conditions. Toilet appliances may be part of a deep laid scheme to prevent strikes.

The fact that the open shop plan is the American plan has not been defended and pressed as it should be. It is precisely and exactly American. It is an appeal to the American youth who has American ideals. The labor union is precisely and exactly not an appeal to the ideals, the psychology, of the American youth.

The apprentice allotments in various trades in various districts are not filled and the reason, of course, is that the youth do not gravitate to those trades. Directly, the apprentice rules do not seem to constitute the barrier, but indirectly they have much influence. The large manufacturer or building trades contractor might well think it to his advantage to formulate a campaign in the schools and elsewhere to attract youth to the lines of work in which he is interested, provided he were in position to employ a reasonable number of applicants; but as matters stand the number admissible is so small that the campaign is not justified.

What will be the outcome of the situation? When a material is strained beyond its limit it breaks, and the same thing occurs in human affairs. The precise manner cannot be foretold, but things cannot continue indefinitely along their recent trend.

In a paper notable for brevity, an engineer has told steel mill operators of a method of control in rolling operations similar to that common in the driving of an automobile. By the use of foot levers, as well as hand levers, it has been possible to operate a reversing mill with two men instead of three, and further improvements are expected. This, while interesting in itself, has a bearing on the labor situation in all manufacturing industries, where in a similar way the control of machinery in many instances may be simplified or unified so that one man may do the work now performed by two or more. Such methods are adaptable, of course, only where large machinery is at work. In such places, however, the possibilities of the foot control ought to be great.

Costs as a Basis for Prices

In more than one direction is there evidence of a definite tendency on the part of steel manufacturers to determine costs of individual products and to base selling prices upon these costs, rather than upon costs of the complete line of products of a particular mill or plant. This is apparent in the new steel pipe discount cards of the National Tube Co., which have been adopted by independent manufacturers. These cards reduced the discounts on standard pipe both black and galvanized, 8-in. and smaller, by two points, equivalent to an advance of $4 per ton. While 9-in. to 12-in. pipe were formerly grouped at one discount they were split into two groups of 9-in. and 10-in., and 11-in. and 12-in., which were advanced $6 and $8 a ton over the old rate on the single grouping. Similar revision of size brackets is observed in large outside diameter pipe, prices of which advanced $8 to $16 a ton, and in lap-welded steel boiler tubes, which moved upward $6 to $14 a ton.

While it is stated that the price structure of steel pipe got quite out of balance during the depression extending from late 1920 until early 1922, when line pipe sold at very low prices, the spread between that product and standard pipe being entirely unwarranted by producing costs, it appears that this was less of a consideration in establishing the new lists than present day costs. And in reckoning costs, no small item is the tonnage of the particular diameter and gage ordinarily called for. There is not a broad market for 9-in. pipe in either standard or oil country pipe, and it is therefore only natural that makers should ask more for that size and others not usually wanted in large quantities, than for those which provide steady occupation for a producing unit.

A second instance of a departure from what may be called haphazard cost distribution is in the proposed extra of $3 a ton for steel bars of screw stock quality. Setting up such a charge was attempted by an independent steel company a few years ago. There was no trouble in obtaining it while business was good, but it did not hold in lean times and finally was abandoned, since the effort brought no supporting response from other manufacturers. Lately, however, it has been found upon serious investigation that the production of screw stock bars has imposed a real burden upon the plant in which such bars are made and that profits on other bars have been reduced accordingly by the practice of distributing costs over the entire product. It is well known that for the best threading results screw stock bars must be high in sulphur and phosphorus. This

is an item of expense if the steel is made in open-hearth furnaces, notwithstanding the specification ban which has put both sulphur and phosphorus in the *bête noir* class. Then there is the extra expense of chipping the billet, and in avoiding pipes the ingot discard is greater than when an ordinary merchant bar is to be rolled. In setting up the extra for screw stock bars, makers also urge that for some time there has been an extra for wire rods of screw stock quality. The change is of special importance to those who buy hot-rolled bars for cold-finishing, since it may well mean the setting up of two base prices, differentiating between the two kinds of cold finished bars.

Still another example of making each product maintain its own footing is found in a revision of the sheet extras for length, width and quality recently made by the leading producer and adopted by others. The extra cost of unusual sizes of sheets, due to limited production, is passed on to buyers.

The Railroads Are Functioning

Elisha Lee, vice-president of the Pennsylvania Railroad, set forth a wholesome idea last week in his address before the Business Science Club of Philadelphia when he said: "To begin with, I should like to get out of your minds the idea that there has been a breakdown of transportation." He admitted occasional congestions and delays and predicted a recurrence next autumn, but insisted that the amount of freight moved has increased greatly in comparison with the investment, pointing out that what the railroads need is greater investment.

Mr. Lee supported his point by citing that in 1900 the United States had a railroad plant representing an investment of about $11,000,000,000, while at the present time there is a $20,000,000,000 plant. Thus in twenty-three years the investment has fallen a trifle short of doubling, whereas the traffic measured in passenger miles and freight ton-miles has tripled.

It may be well to elaborate here on this point. The January freight ton-mileage, recently reported, was 37,668,368,000. The business was handled rather smoothly, and the factor of January traffic being 7.8 per cent of the year's total in a normal year may properly be applied. This would make 483,000,000,000 ton-miles for the year. The year may not show as much, but the railroads give evidence of having ability to perform such an amount of service.

It was not until 1907 that the railroads had one-half as great a ton-mileage. Thus there is a doubling in sixteen years. A survey of statistics for half a century previous shows a general tendency of the traffic to double in an average period of twelve years. Now we have a doubling in sixteen years.

Only by tremendous increases in efficiency, or by the abandonment of other activities, can any single activity, like the production of pig iron, the building of houses or the movement of freight, double continuously in any short period. The 14.9 per cent increase in population shown from 1910 to 1920 means a doubling in population in fifty years. If we increase a given activity at a greater rate we must either increase the efficiency, reducing the man power per unit of results, or rob other industries of workmen. The same principle that applies to the supply of workers applies to the supply of capital. In the early decades of the country's history the accumulation of capital was very slight. Later, by reason of efficiency in obtaining results, savings increased and more capital accumulated.

Railroading thus has done very well indeed to double its service in sixteen years. As Mr. Lee insists, the capital absorbed has not increased in proportion. There has been a great increase in efficiency.

The railroads are functioning and functioning well considering the circumstances. They do not ask for more capital because they have broken down, but because the country needs increasing railroad service year by year. The total supply of capital is only so great, representing the savings of the people as a whole. At times the supply of capital offered seems greatly to increase or decrease, but these sudden changes represent largely a change in men's minds as to what can be earned or saved in future. The amount of capital offered depends in great measure, through the medium of credit, on an appraisal of what can be saved in future years.

The interest of the railroads in the supply of capital is two-fold. If industries function well, which they cannot do with poor railroad service, credit is improved and the total supply of capital offered increases. That is one point. The other point is the proportion of the total supply of capital that will be offered for railroad investment. The railroads should be allowed to earn money, as other businesses are allowed to earn money, so that a proper proportion of the total capital shall be offered to them. Let them become able to render greater service and the total supply of capital, through credit or a higher appraisal of the future earning capacity of the country, will be increased.

CORRESPONDENCE

Problem of the Labor Shortage

To the Editor: We suggested in our report of the industrial relations committee of the American Gear Manufacturers' Association two methods which would tend to prevent the acute shortage of labor from being more pronounced. We regret that you mis-construed this to mean that the supply would be ample if properly distributed.

Our report read: "At every meeting of the employers, the point most strongly brought out was that bidding against each other for labor does not increase the productive hours, but has a tendency to raise labor prices so high that it may put a crimp in the present wave of prosperity." You stated in issue of April 26 that: "The report indicated that the supply of labor would be plentiful if properly distributed and urged employers to abstain from hiring men away from each other's plants.

ELIOT A. KEBLER,
President Fawcus Machine Co.

Pittsburgh, April 27.

Notable Foundry Gathering at Cleveland

Pronounced Optimism the Ruling Sentiment—Large Exhibition Facilities Not Equal to Demand—Attendance Large—Technical Sessions of Monday and Tuesday—New Officers

CLEVELAND, May 1.—The present prosperity in all branches of the foundry industry is clearly reflected in the gathering of American foundrymen here in Cleveland for their twenty-seventh annual convention and exhibition which are now in full swing. The pronounced optimism is the ruling sentiment in the technical meetings, in the exhibition and in the atmosphere of the city itself. From the very start this year's gathering has been a success. It is a little too early to say definitely to what extent it may surpass previous meetings in attendance. It is expected to register a new high mark in the completeness of its preparedness, particularly in that of the exhibition on its first opening day. There has been no parallel in previous efforts.

Cleveland's new $6,300,000 Public Auditorium houses the exhibition, and the technical sessions are being held at the Hollenden Hotel. The auditorium is a magnificent structure and the display of the exhibitors is remarkably complete. It is the Mecca which is drawing the crowd somewhat to the detriment of the technical sessions. Even this large new building is inadequate to take care of the present exhibition without considerable crowding.

An excellent technical program has been prepared. Fewer papers as a whole is a feature and a commendable one. Among the papers are several which deal with some unusual and striking new developments in foundry metallurgy and operation.

Total registration this afternoon had reached about 3000 and the probabilities are in favor of the Columbus record of 4000 in 1920 being exceeded before the close of the convention on Thursday.

Officers Elected

At the general meeting this afternoon the following officers were elected for the ensuing year: G. H. Clamer, Ajax Metal Co., Philadelphia, as president and H. B. Swan, Cadillac Motor Co., Detroit, as vice-president. The new directors, who are to serve for the next three years, were selected as follows: L. L. Anthes, Anthes Foundry, Ltd., Toronto; T. S. Hammond, Whiting Corporation, Harvey, Ill.; Alfred E. Howell, Somerville Stove Works, Somerville, N. J.; C. R. Messinger, Chain Belt Co., Milwaukee; Thomas W. Pangborn, Pangborn Corporation, Hagerstown, Md.

Besides the various activities of the foundrymen, there is also being held in conjunction with this convention the spring meeting of the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers and also a general meeting of the American Malleable Castings Association.

The T. Obermayer Co., Chicago, had an all-day meeting of its selling staff at the Hollenden Hotel on Friday, April 27, presided over by S. T. Johnston, vice-president. The discussions, which were participated in by all the 26 representatives in attendance, covered all phases of the present situation in the foundry trade, which as a whole is now busier than at any time in nearly three years, lack of molders being the chief limiting factor.

The Technical Sessions

The first technical sessions were held yesterday afternoon. The one devoted to steel foundry subjects took place simultaneously with that on aluminum and aluminum alloys. They were both exceedingly well attended.

While no separate session, devoted to distinctly international papers, features this year's convention, this element is not missing. At the aluminum session yesterday afternoon Emile Ramas, president of the Association technique de fonderie and director of the Francaise Metallurgique (Griffin), Paris, delivered a short address in French which was interpreted by Georges Virolle, New York. M. Ramas is touring the United States and is a special guest of the convention.

Besides this address the annual exchange paper from the French Foundry Association was presented, entitled, "Aluminum and Light Alloys," and written by R. de Fleury of that association. The paper was presented by G. H. Clamar, Ajax Metal Co., Philadelphia, in the author's absence. Three other papers were presented and discussed. These will be reviewed in THE IRON AGE, May 10.

The steel foundry session yesterday afternoon was unique in that it is particularly the only one of the week for which reprints of the papers were not available. The four papers which were presented were all delivered from manuscript or extemporaneously and each one was illustrated by lantern slides. Major Minton, U. S. Ordnance Department, Watertown Arsenal, Watertown, Mass., discussed the "Production of Light Steel Castings for Ordnance Work," and A. D. Williams, Cleveland, explained certain principles of "Heat Generation in Open-Hearth Practice," by means of charts.

The most interesting feature of this steel session was the "Centrifugal Casting of Doughnut Steel Ingots and Rings," by the McConway process. This was discussed in THE IRON AGE Feb. 1, 1923. The presentation was made by Harvey Allen of the McConway & Torbey Co., Pittsburgh, by means of slides and a motion picture.

The last paper of the steel session was by H. W. Dietert, University of Illinois, Urbana, Ill., on the "Application of the Microscope and Camera to the Study of Steel Molding Sands." Further reviews of these papers will appear in THE IRON AGE, May 10.

Today has been most active in the matter of the technical contributions. Five sessions have been held. Three this morning and two this afternoon. The morning sessions have been devoted to a symposium on industrial education or the training of foundry workers; to non-ferrous foundry practice and to a general session covering electrical furnace gray iron and synthetic iron, including a film showing the old and new way of making cast iron pipe or the contest between the sand and the centrifugal processes as carried on by the United States Cast Iron Pipe and Foundry Co. at Birmingham.

Sessions on sand research, embracing particularly the new testing methods which have been developed by the recent research organizations and committees of the general business session, took up the afternoon.

The Exhibition

A radical departure from the custom of former years was inaugurated this year as to the time of opening the exhibition. The new plan has met with unqualified success.

This is the first time that the exhibits have been thrown open on Saturday of the week preceding the usual convention days. On former occasions Monday has been the opening day with the technical sessions commencing on Tuesday. This year these sessions began Monday afternoon.

It can be stated that, as a result of the new plan, this is the first occasion in the history of the foundrymen on which the exhibits were in presentable shape on the first day. The cause is evident: There is no Sunday or Saturday afternoon intervening with the uncertainty of getting sufficient labor or supplies.

The exhibition is a complete success. In number and diversity of those participating it is fully equal to any other affair. Unfortunately the new Cleveland auditorium, splendid as it is in every respect for such a show, does not offer space that measures up to the magnitude to which this foundrymen's exhibition has grown.

More Space Could Have Been Sold

Confronted with this fact, the management early saw that when the entire space had been engaged within a month from the opening of the books on Jan. 15, or by Feb. 15, they had to ask many of the older exhibitors to cut down their requirements so as to accommodate others. A spirit of give and take was readily entered into. Even at that, however, it now develops that there have been so many later applications for space that the floor of the Coliseum, across the street, could easily have been filled—a space equal to more than half that of the main arena of the auditorium.

While therefore the space used at the present exhibition does not equal that at Columbus in 1920 or at Rochester in 1922, it is evident that the character of the exhibits is quite as representative as in any previous year, if not more so. One authority makes the statement that this affair has now grown to such large proportions that there is no one building in the United States which can house it. At Columbus and Rochester, fair grounds and exposition buildings were used.

At least 200 different companies are represented on the two floors of the auditorium, using the space in the main arena as shown by the illustration, the space in the adjoining corridors outside and the large basement space below the arena. On this lower floor all the heavy machinery and similar apparatus are displayed in working condition. There are about a dozen molding machines in active demonstration, including vibrators and various molding accessories. There are several large material and sand handling machinery displays and there are also cranes, tramrails, trailers and trucks, hoists, belt conveyors, etc. Machine tool exhibitors are fewer than in recent shows because of the limited space.

Saturday, the opening day, was Cleveland Day. Special arrangements were made for employees of the city's foundry and iron and steel industry, the extent of which is briefly indicated in what follows, to visit the exhibition. It was kept open until 10 p.m. for this purpose, the only evening on which it was open. The offer was eagerly taken advantage of and a large attendance was recorded.

Earlier Meetings in Cleveland

This is the third visit of American foundrymen to the city of Cleveland. In 1906 the eleventh annual convention of the American Foundrymen's Association was held in this city and it was also the occasion of the first official exhibition. In that year there were 42 exhibitors and a registration of 600. In 1916 the twenty-first annual convention was also held at Cleveland and then there were 173 exhibitors and a registration of 2600 members and guests. This year, the twenty-seventh annual meeting and exhibition, there are officially reported 201 exhibitors under contract with provisions made for a registration of 4000.

To handle this year's affair, which probably outranks any other in the history of the organization, an executive committee of eight is responsible for all the arrangements, and is made up of the following persons; Ralph H. West, chairman, West Steel Castings Co., J. R. Raible, Fanner Mfg. Co., A. O. Backert, Penton Publishing Co., Werner G. Smith, Werner G. Smith Co., Mrs. W. C. Sly, 15426 Lake Avenue, C. F. Knowlton, Westinghouse Electric & Mfg. Co., D. M. Avey, Penton Publishing Co., E. W. Beach, Ferro Machine & Foundry Co.

No other city shares the distinction of having entertained this convention for the third time. There are several reasons for this. Besides the fact that its location is favorable, Cleveland is the fourth city of the country in the number of its foundries, and Ohio is the second State. Cleveland is also essentially a metal-working center and its industries are noted for their modern equipment and methods. Cleveland is also one of the important pig iron and steel making districts of the country. In fact, in no other city in which the foundrymen have gathered are there so many important steel and iron working plants within such easy reach of convention headquarters. Practically all of these industries are open for the inspection of visitors.

Cleveland as a Foundry Center

As a foundry center, Cleveland is distinguished by its diversity of products. While other foundry centers have more casting plants and a few have a greater output, Cleveland stands supreme in the variety of the cast products made within its boundaries. According to 1922 statistics there are 117 foundries in Cleveland, the greater number of which are known as jobbing foundries, but there are many casting plants operated in connection with other manufacturing establishments

and a few make castings exclusively for parent companies, where they constitute departments of large manufacturing units.

The first available record indicates that John Ballard & Co. started a foundry in Cleveland in 1828, about 20 years after the settlement was made at the mouth of the Cuyahoga River. The first chartered business establishment in the city was the Cuyahoga Steam Furnace Co., incorporated in 1834 by Charles Hoyt, Richard Lord and others. Pig iron was supplied from a blast furnace at Dover, 12 miles away. This foundry made cannon for the Government in 1841 and afterward made railroad construction machinery and locomotives. The first locomotive west of the Allegheny mountains was made in this plant and was put in service on the Detroit & Pontiac Railroad. Three years later an old city directory lists four foundries, and a few of the shops which now exist made their appearance in those early years. The Otis Steel Co., which now operates an extensive steel foundry and rolling mill on the east side, may be traced back to the partnership of William A. Otis and J. M. Ford, formed in 1852. The foundry of Hovey, Taylor & Son, founded in 1866, became finally the Taylor & Boggis Foundry Co., which now operates two well known gray iron jobbing shops.

A few of the outstanding establishments may be mentioned as typifying the present foundry industry of the city. Allyne-Ryan Foundry Co., Ferro Machine & Foundry Co., and Interstate Foundry Co. have a combined output of over 500 tons per day of automobile castings. The American Shipbuilding Co. is representative of the marine castings line and produces about 10 tons per day. The National Malleable Castings Co., in the Cleveland unit of its extensive organization, makes automobile, railroad and general jobbing malleable castings. This plant with Chisholm & Moore Mfg. Co., Eberhard Mfg. Co., and the Grabler Mfg. Co., produces over 5000 tons per month of malleable castings. The Standard Car Wheel Co. and the National Car Wheel Co., together have a capacity of 225 tons per day of wheels, and at the present time, with the rapidly growing railroad demand, are pushed to capacity.

In aluminum castings, Cleveland is said to have blazed the trail. The leading company in this line is the Aluminum Manufactures, Inc., formerly the Aluminum Castings Co. A large part of its product is made by the permanent mold process. Other companies using a large amount of aluminum annually are the Aetna Brass Mfg. Co., the Arth Brass & Aluminum Casting Co., City Brass Foundry, Cleveland Aluminum Casting Co., Electric Vacuum Cleaner Co., Hammond Metal Products Co., Hoffman Bronze & Aluminum Co., International Permold Co., Motor Pattern Co., National Bronze & Aluminum Foundry Co., Proof Machine & Foundry Co., Standard Brass Foundry Co., and Wellman Bronze Co.

As a producing center of pig iron and steel, Cleveland has long ranked important. Its iron and steel making capacity has been largely increased in the last few years. The first iron ore from the Lake Superior mines was shipped to Cleveland in 1852, the quantity being contained in half a dozen barrels. The Cleveland Iron Co. was established in 1849 to mine Lake Superior ore but it did little until 1853, at which time it was reorganized and Samuel Mather, senior member of Pickands, Mather & Co., became its vice-president.

The beginning of the iron and steel industry in Cleveland appears to have been in the establishment of a small foundry in 1828. In 1834 the Cuyahoga Steam Furnace Co. started operations, and "this was the first furnace in the vicinity to use steam instead of horse power for the blast." The industrial leaders of Cleveland early awoke to the importance of the city's location for converting iron ore into pig iron and steel. The names of two sturdy pioneers, William A. Otis and Henry Chisholm, were prominently identified with Cleveland's early iron and steel industry. Mr. Chisholm founded the firm of Chisholm, Jones & Co. to make railroad and bar iron. The latter became the Cleveland Rolling Mill Co. and still later one of the plants of the American Steel & Wire Co. Incidentally, Mr. Chisholm was one of the first to make a commercial success of the Bessemer steel-making process. The plant established in that year by Mr. Otis and a partner

Arena Floor of the Foundry and Machine Exposition in the New Cleveland Auditorium

was a foundry which eventually became the Otis Steel Co. In 1859 Mr. Otis built the first rolling mill in Cleveland to roll merchant bars. Following the Civil War, development of the iron and steel industry was fairly rapid.

Cleveland now has 12 blast furnaces which produce approximately 170,000 tons of pig iron per month, the greater part of which is consumed in the city in the production of steel and in the local foundries. Foundries in Cleveland and its suburbs, it is estimated, consume annually 275,000 tons of pig iron, the bulk of which comes from local furnaces. The city has ten steel plants, not counting wire manufacturing plants. Four producing companies have open-hearth furnaces with an annual ingot capacity of about 2,000,000 tons. The city's principal finished steel products are plates, sheets, steel bars and wire products. One plant—that of the McKinney Steel Co.—makes no finished steel but produces a large tonnage of semi-finished steel in the form of sheet bars, billets and slabs. Another open-hearth steel plant is now being erected by the Otis Steel Co., which is also building a finishing mill plant for making strip steel. Considerable of the iron ore that reaches Cleveland is converted in that city into finished products such as nails, wire, bolts and nuts.

With five blast furnaces, a steel plant, five wire drawing plants and coke works, the American Steel & Wire Co. is by far the largest producer of finished steel in Cleveland. This company employs in its various Cleveland plants 12,000 to 15,000 men and produces from 45,000 to 50,000 tons of nails and other wire products per month. Its products include steel wire in all its forms and kinds, covering hundreds of individual items.

A number of the largest and most important manufacturers of foundry supplies in the country are located in the Cleveland district. Nearly 60 per cent of the entire production of chaplets is made here. The largest plant devoted exclusively to the manufacture of core oils is also located here. There are besides a number of very large producers of foundry sand in this district.

New Extras for Sheets

[illegible] manufacturers of steel sheets have adopted a new set of extras for sizes on galvanized, [illegible] New extras also have been set up for quantities. The gages and [illegible] in the various finishes also are defined. The new extras primarily [illegible] costs, and also to discourage orders for material of unusual dimensions. They are [illegible]

GALVANIZED SHEET SIZE EXTRAS (DIMENSIONS IN INCHES)

Width Extras												*Length Extras*									
75c	60c	50c	40c	35c	30c	25c	20c	15c	10c	Base	GAGE	Base	10c	20c	25c	30c	35c	50c	60c	75c	1.00	1.50
..	..	..	..	..	..	6	12	..	..	24	10-12	60	30	18	..	..	..	..	..	..	..	..
..	..	..	54	..	52	..	48	..	44	40		144	..	..	..	..	..	168	192	216	228	..
..	..	..	..	..	..	6	12	..	..	24	13-14	60	30	18	..	..	..	..	..	..	..	..
..	..	..	54	..	52	..	48	..	44	40		144	..	..	..	..	..	168	..	192	216	228
..	..	..	..	..	..	6	12	..	..	24	15	60	30	18	..	..	..	..	..	..	..	..
..	..	..	54	..	52	..	48	..	44	40		144	..	..	..	..	..	168	..	180	..	..
..	..	..	..	..	..	6	12	..	..	24	16	60	30	18	..	..	..	..	..	..	..	..
..	..	54	..	52	..	..	48	..	44	36		144	..	..	..	..	..	168	..	180	..	..
..	..	..	..	..	6	..	12	..	..	24	17-18	60	..	30	..	18	..	..	..	..	..	..
..	..	54	..	52	..	..	48	..	44	36		124	144	..	..	..	..	..	..	..	..	..
..	..	..	..	..	6	..	12	..	..	24	19-21	60	..	30	..	18	..	..	..	..	..	..
54	..	52	48	..	44	..	40	..	..	36		124	144	..	..	..	..	..	..	..	..	..
..	..	..	..	..	6	..	12	..	..	24	22-24	60	..	30	..	18	..	..	..	..	..	..
..	48	..	44	..	..	..	40	..	..	36		124	144	..	..	..	..	..	..	..	..	..
..	..	..	..	6	..	12	..	..	..	24	25-26	60	..	..	30	..	18	..	..	..	..	..
..	44	..	..	..	40	..	..	..	..	36		124	144	..	..	..	..	..	..	..	..	..
..	..	..	..	6	..	12	..	..	..	24	27	60	..	..	30	..	18	..	..	..	..	..
44	..	40	..	..	..	..	..	..	36	32		124	144	..	..	..	..	..	..	..	..	..
..	..	..	..	6	..	12	..	..	..	24	28	60	..	..	30	..	18	..	..	..	..	..
..	40	..	..	..	..	..	36	..	..	32		124	144	..	..	..	..	..	..	..	..	..
..	..	..	..	6	..	12	..	..	..	24	29-30	60	..	..	30	..	18	..	..	..	..	..
..	..	..	..	..	..	..	36	..	..	32		124	144	..	..	..	..	..	..	..	..	..

BLACK SHEET SIZE EXTRAS (DIMENSIONS IN INCHES)

Width Extras									*Length Extras*					
40c	30c	25c	20c	15c	10c	5c	Base	GAGE	Base	10c	15c	20c	25c	30c
..	..	..	6	..	12	..	24	10-16	60	30	18	..	..	..
..	..	..	..	..	..	..	48		144	..	..	..	..	..
..	..	6	..	12	..	..	24	17-18	60	..	30	..	18	..
..	..	..	..	..	..	48	36		124	144	..	..	..	..
..	..	6	..	12	..	..	24	19-21	60	..	30	..	18	..
..	..	48	..	44	..	..	36		124	144	..	..	..	..
..	..	6	..	12	..	..	24	22-24	60	..	30	..	18	..
48	..	..	40	..	..	..	36		124	144	..	..	..	..
..	6	..	12	..	..	..	24	25-27	60	..	..	30	..	18
44	..	..	40	..	..	..	36		124	144	..	..	..	..
..	6	..	12	..	..	..	24	28	60	..	..	30	..	18
40	..	..	..	..	36	..	32		124	144	..	..	..	..
..	6	..	12	..	..	..	24	29-30	60	..	..	30	..	18
..	..	..	..	..	36	..	32		124	144	..	..	..	..

BLUE ANNEALED SIZE EXTRAS (DIMENSIONS IN INCHES)

Width Extras				*Length Extras*		
15c	10c	Base	GAGE	Base	10c	15c
6	12	24 and wider	16 and Hvr.	60 and longer	30	18

All of these products are subject to the following extras for **other than standard sizes and gages:**

Items under 5000 lb. and not less than 2500 lb.....10c per 100 lb.
Items under 2500 lb. and not less than 1000 lb.....25c per 100 lb.
Items under 1000 lb.....50c per 100 lb.
For shipment of the "exact quantities specified".....10c per 100 lb.
All extras are per 100 lb.

Gages and sizes which are considered standard in blue annealed and black sheets, and galvanized products:

Blue annealed:—Even gages. Widths: 24 26, 28, 30, 36, 42, 48. 60 and 72 in. Lengths: 72, 84, 96, 120 and 144 in.

Black sheets:—No. 25 and heavier in even gages. No. 26 to 30: Widths: 24, 26, 28, 30 and 36 in. Lengths: 72, 84, 96 and 120 in. Also, 24 x 101 in. for stove pipe manufacture.

Galvanized:—No. 30 and heavier in even gages. Widths: 24, 26, 28, 30 and 36 in. Lengths: 72, 84, 96 and 120 in.

Formed roofing:—No. 28 gage and heavier in even gages for black, painted and galvanized and No. 29 gage in galvanized. Widths: All regular widths for the various forms. Lengths: 60, 72, 84, 96, 108, 120, 132 and 144 in. Black and galvanized size extras will apply. Lengths other than standard and widths other than regular for the various forms are subject to sheet mill extras for quantity. The extra for shipment of "exact quantities specified" does not apply.

Long ternes will be subject to all extras applying to galvanized sheets and all black sheets, except that tack plate will be subject to all extras applying to black sheets.

FABRICATED STEEL BUSINESS

Large Volume of Work Awarded Mostly on Private Account

Over 27,000 tons of fabricated steel work was put under contract in the past week, of which 60 per cent was on private account, as the following items will show, with nearly 25 per cent for public structures and most of the remainder for railroads:

Public Schools Nos. 66 and 67, New York, 1600 tons each, to A. E. Norton, Inc.

Interborough Rapid Transit Co., New York, inspection sheds, 650 tons, to an unnamed fabricator.

Public School No. 100, Brooklyn, 750 tons, to Harris Structural Steel Co.

Boston & Maine Railroad, bridges, 500 tons, to Boston Bridge Works.

Oxford Paper Co., Rumford, Me., addition to buildings, 500 tons, to Megquier & Jones.

Public Service Corporation of New Jersey, power plant at Marion, N. J., 400 tons, to Hay Foundry & Iron Works.

Highway bridge at Johnstown, Pa., 400 tons, to American Bridge Co., subject to approval of municipal authorities.

Atlantic Coast Line, bridges, 250 tons, to an unnamed fabricator.

Heine Boiler Co., St. Louis, additions, 125 tons to St. Louis Structural Steel Co.

Roxana Petroleum Corporation, St. Louis, refinery at Arkansas City, tank and structural steel to United Iron Works,

National Plate Glass Co., subsidiary of General Motors Corporation, plant at Ottawa, Ill., 9000 tons, to Mississippi Valley Structural Steel Co.

South Park Commission, Twenty-third Street Viaduct, Chicago, 2362 tons, to Mount Vernon Bridge Co.

Missouri Highway Commission, bridge work, State of Missouri, 1213 tons, divided among Vincennes Bridge Co., St. Louis Structural Steel Co. and Pittsburgh-Des Moines Steel Co.

Denver & Rio Grande Western, shops, Denver, Colo., 1000 tons, to Virginia Bridge & Iron Co.

Northern Pacific, miscellaneous bridges, 97 tons, to Milwaukee Bridge Co., and 225 tons to unidentified fabricator.

Missouri Pacific, 100 ft. lift span, bridge No. 31, Osage, Mo., 242 tons, to American Bridge Co.

Brenner, Moxley & Mervis Co., copper rod and wire mill, Chicago, 270 tons, to A. Bolters Sons Co.

Shaw Farm Bridge, Bruce, Wis., 143 tons, to Wausau Iron Works.

Walker Vehicle Co., plant addition, Chicago, 125 tons, to unidentified fabricator.

Masonic Temple, Battle Creek, Mich., 150 tons, to Elkhart Bridge & Iron Co.

Gasholders at Louisville, Ky., 500 tons, and Washington, Pa., 300 tons, to Stacey Mfg. Co.

Ford Motor Co. additions at Iron Mountain, Mich., 4000 tons, to Worden-Allen Co.

Elks' Clubhouse, Milwaukee, 2615 tons, bids still under consideration but probably will be let to Massillon Bridge Co., low bidder.

Shadbolt & Boyd Iron Co., Milwaukee, warehouse, 120 tons, to Lakeside Bridge & Steel Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Peddie Institute for Boys, Hightown, N. J., 300 tons.

Norfolk & Western Railroad, bridges, 800 tons.

Public Service Commission, New York City, Flushing extension of subway-elevated lines, 6200 tons; former bids having been rejected, new bids will be received up to May 8.

Penn-Harris Hotel, Harrisburg, Pa., addition, 600 tons.

Title Guarantee & Trust Co., addition to building on Maiden Lane, New York, 300 tons.

Baltimore & Ohio Railroad, bridges, 1000 tons.

Butler Corporation, office building, Chicago, 1200 tons, bids in.

National Guard Armory, Peoria, Ill., 520 tons, bids in.

Bank building, Newburgh, New York, 260 tons, bids taken by Weary & Alford, Chicago.

Illinois Central, 12 deck plate girder spans, 1400 tons.

Public Library, Cleveland, 4000 tons.

Wig-More Coliseum, Cleveland, addition, 300 tons.

National Biscuit Co., Buffalo, bakery, 1000 tons.

RAILROAD EQUIPMENT BUYING

Orders and Inquiries for Both Cars and Locomotives in Fair Volume

The week's items of railroad equipment buying activity include the following:

The Chicago, Burlington & Quincy Railroad is in the market for 5 locomotives.

The Johnstown Coal & Coke Co., Johnstown, Pa., has placed an order with the American Car & Foundry Co. for 150 70-ton hopper cars.

The United States Fuel Co. has ordered 500 70-ton hopper cars from the General American Car Co.

The Matheson Alkali Works, New York, has ordered 25 special cars for hauling chlorine from the Standard Steel Car Co.

The Missouri Pacific Railroad is in the market for 40 Mikado-type and 10 Pacific-type locomotives.

The Missouri Pacific is inquiring for 50 to 75 locomotives and the Gulf, Mobile & Northern for 2 engines.

The Kansas City Southern bought 10 mallet type engines from the American Locomotive Co.

The Florida East Coast has placed 15 Mountain type and 5 switching locomotives with the American Locomotive Co. and is inquiring for 8 coaches, 2 baggage, 15 mail, 10 caboose, 200 flat and 200 box cars.

The Brooklyn City Railways have placed 100 street cars with the St. Louis Car Co. and an equal number with the J. B. Brill Co.

The Union Refrigerator Transportation Co. has ordered 105 steel underframes from the American Car & Foundry Co.

The Union Pacific will build 50 caboose cars at its Albina, Ore., shops.

The Minnesota Steel Co. is inquiring for 20 gondola and 20 flat cars.

The Atlantic Coast Line is in the market for 25 coaches, 15 express, 5 baggage and mail and 50 caboose cars.

The Kansas, Oklahoma & Gulf contemplates reviving an inquiry for 300 gondola cars.

The Hocking Valley has sent out new inquiries for 1000 automobile cars, instead of 2000 on which figures were previously taken.

The Akron, Canton & Youngstown is inquiring for 2 baggage and mail cars.

Negro Labor Imported at Youngstown

YOUNGSTOWN, May 1.—Employment conditions still continue to attract interest among independents, for the reason that supply of common labor is dwindling. One of the Corporation subsidiaries has recently imported large numbers of negro workmen from Virginia, paying their fare to Youngstown. An independent has likewise secured common labor from the South in large numbers. Employment managers are hard put to meet the shortages constantly arising in the mills and production is being held back to some extent for this reason.

The Pere Marquette Railroad has an extensive terminal project planned for establishment at Erie, Mich., providing the board of Monroe county commissioners sanction the closing of several highways on their recently acquired property at that point adjoining their present right-of-way. The program covers an expenditure of approximately $2,000,000, which include the construction of a freight yard consisting of 34 tracks capable of storing 5000 freight cars; a round house, 450 ft. in diameter with capacity of 16 locomotives; a machine shop and service building for employees.

An investigation of the fatigue of metals by H. F. Moore and T. M. Jasper of the Engineering Experiment Station of the University of Illinois has been made the subject of bulletin No. 136 of the station. It is the second report to be issued and copies may be obtained by addressing the station at Urbana, Ill.

Brassert gas washers together with a Dorr thickener and equipment for recovery of flue dust carried in the gas washer discharge water are to be installed at the works of the Donner Steel Co. at Buffalo by Freyn, Brassert & Co., Chicago.

APRIL PIG IRON OUTPUT

All Records Broken with Increase of 4500 Tons a Day Over March

Net Gain of 14 Furnaces—Yearly Production Rate Now Nearly 44,000,000 Tons

April, a 30-day month, had a greater pig iron output than March with its 31 days, and broke all records both for daily and monthly production rates. The total was 3,547,551 tons, or 118,252 tons a day, against 3,523,868 tons in March, or 113,673 tons a day. The greatest previous output for a month was 3,508,849 tons in October, 1916.

The April output shows a gain of 4579 tons a day over that of March. The month shows a net increase of 14 in the number of furnaces in blast, or from 296 on April 1 to 310 on May 1. We estimate the capacity of the 310 furnaces in blast on May 1 at 119,500 tons a day, against 116,100 tons a day for the 296 furnaces in operation one month previous.

Estimating the present charcoal iron production at something over 300,000 tons a year, the country was producing pig iron on May 1 at a yearly rate of close to 44,000,000 tons. This is over 10 per cent more than the total of 39,434,000 tons in the record year 1916.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for April and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	April (30 days)	March (31 days)	Feb. (28 days)	Jan. (31 days)
New York	235,633	226,668	181,215	186,256
New Jersey	18,758	12,551	12,740	14,076
Lehigh Valley	87,340	83,690	69,877	64,457
Schuylkill Valley	108,659	97,065	84,763	85,162
Lower Susquehanna and Lebanon Valleys	46,682	44,558	36,147	40,589
Pittsburgh district	769,822	790,708	624,331	694,075
Shenango Valley	146,030	136,502	124,736	135,962
Western Pa.	199,560	180,926	148,330	152,475
Maryland, Virginia and Kentucky	103,244	109,253	84,310	76,675
Wheeling district	146,394	134,026	115,511	125,008
Mahoning Valley	361,336	383,469	325,275	345,997
Central and Northern Ohio	298,803	319,774	296,168	325,547
Southern Ohio	60,356	51,186	49,426	56,478
Illinois and Indiana	555,475	534,680	462,376	524,774
Mich., Minn., Mo., Wis. and Colo.	144,362	140,354	130,361	147,540
Alabama	241,698	254,239	227,254	232,690
Tennessee	23,399	24,219	21,367	21,843
Total	3,547,551	3,523,868	2,994,187	3,229,604

Among the furnaces blown in in April were the following: One Wharton in New Jersey, one Warwick in the Schuylkill Valley, one Steelton in the Susquehanna Valley, one Lebanon in the Lebanon Valley, Ella, Stewart and Fannie in the Shenango Valley, Adrian and one Josephine in Western Pennsylvania, one Crozer in Virginia, one Weirton in the Wheeling district, one Wellston and Hamilton in Southern Ohio, one Joliet, two South Chicago, and one Gary in the Chicago district, and Rockdale in Tennessee.

The furnaces blown out in April were Sheridan in the Lebanon Valley, one Duquesne in the Pittsburgh district, Struthers in the Mahoning Valley, and one River in Northern Ohio.

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of the daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from April, 1922, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
April, 1922	56,930	12,140	69,070
May	60,619	13,790	74,409
June	62,534	16,167	78,701
July	62,295	15,297	77,592
August	45,672	12,914	58,586
September	53,856	13,935	67,791
October	66,060	19,032	85,092
November	72,177	22,813	94,990
December	75,179	24,398	99,577
January, 1923	79,991	24,190	104,181
February	80,684	26,251	106,935
March	87,881	25,792	113,673
April	.....	.....	118,252

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1919—Gross Tons

	1919	1920	1921	1922	1923
Jan.	3,302,260	3,015,181	2,416,292	1,644,951	3,229,604
Feb.	2,940,168	2,978,879	1,937,257	1,629,991	2,994,187
Mar.	3,090,243	3,375,907	1,595,522	2,035,920	3,523,868
Apr.	2,478,218	2,739,797	1,193,041	2,072,114	3,547,551
May	2,108,056	2,985,682	1,221,221	2,306,679	.....
June	2,114,863	3,043,540	1,064,833	2,361,028	.....
½ year	16,033,808	18,138,986	9,428,166	12,050,683	.....
July	2,428,541	3,067,043	864,555	2,405,365	.....
Aug.	2,743,388	3,147,402	954,193	1,816,170	.....
Sept.	2,487,965	3,129,323	985,529	2,033,720	.....
Oct.	1,863,558	3,292,597	1,246,676	2,637,844	.....
Nov.	2,392,350	2,934,908	1,415,481	2,849,703	.....
Dec.	2,633,268	2,703,855	1,469,086	3,086,898	.....
Ttl. yr.	*30,582,878	36,414,114	16,543,686	26,880,383	.....

*These totals do not include charcoal pig iron. The 1922 production of this iron was 224,731 tons.

The figures for daily average production, beginning with January, 1917, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1917—Gross Tons

	1917	1918	1919	1920	1921	1922	1923
Jan.	101,643	77,799	106,525	97,264	77,945	53,063	104,181
Feb.	94,473	82,835	105,006	102,720	69,187	58,214	106,935
Mar.	104,882	103,648	99,685	108,900	51,468	65,675	113,673
Apr.	111,165	109,607	82,607	91,327	39,768	69,070	118,252
May	110,238	111,175	68,002	96,312	39,394	74,409	.....
June	109,002	110,793	70,495	101,451	35,494	78,701	.....
July	107,820	110,354	78,340	98,931	27,889	77,592	.....
Aug.	104,772	109,341	88,496	101,529	30,780	58,586	.....
Sept.	104,465	113,942	82,932	104,310	32,850	67,791	.....
Oct.	160,550	112,482	60,115	106,212	40,215	85,092	.....
Nov.	106,859	111,802	79,745	97,830	47,183	94,990	.....
Dec.	92,997	110,762	84,944	87,222	53,196	99,577	.....
Year	104,619	105,496	83,789	99,492	45,325	73,645	.....

Production Gains at Youngstown

YOUNGSTOWN, May 1.—Steel production in the Mahoning Valley registers further gains this week, with the resumption of two open-hearth furnaces at the Lansingville plant of the Republic Iron & Steel Co. These units were built during the war through an arrangement with the Federal Government. Following lengthy negotiations, a settlement has finally been reached whereby they may be operated.

Of the 51 independent open hearths in the district, 49 are now charged, while all of the 30 Corporation units are melting, giving a total of 79 active units, of 81. This is the best operating record in so far as the open-hearth process is concerned in the past three years.

Sheet mill production is again at its previous level, four mills which were idle at the Thomas works of the Youngstown Sheet & Tube Co. last week having resumed. Due to the building of a new heating furnace by the Mahoning Valley Steel Co., one of its mills is down, while a jobbing unit at the Niles plant of the Republic Iron & Steel Co. is on the inactive list.

There are now 40 blast furnaces in the Mahoning and Shenango Valleys pouring, out of 46. They are

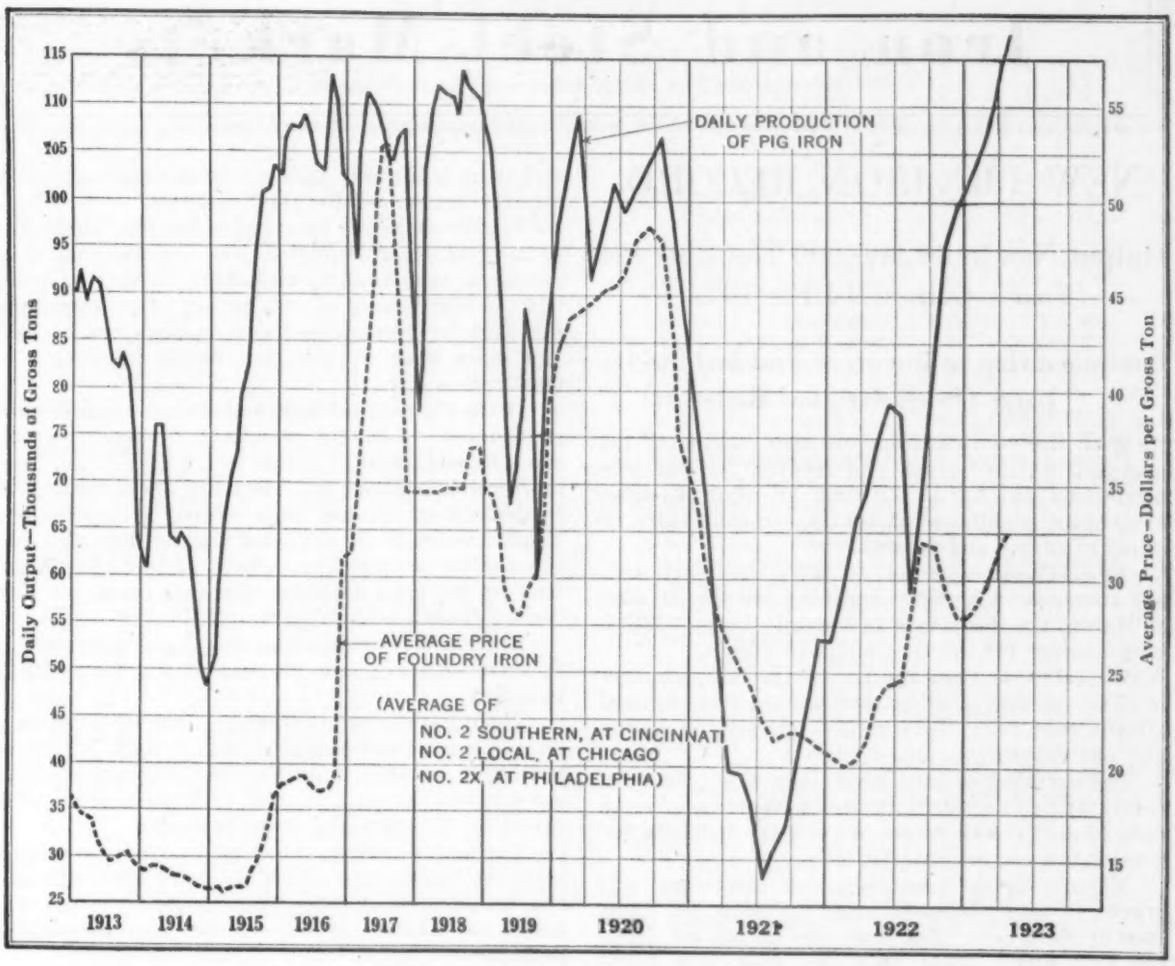


Diagram of Pig Iron Production and Prices

divided as follows—Carnegie Steel Co., 15, of which seven are in the Mahoning Valley and eight in the Shenango Valley; all but one of the 19 independent stacks connected with iron or steel refining properties, while the balance are merchant stacks.

The Sheet & Tube company has nine furnaces active; Republic Iron & Steel Co., six with one idle; the Trumbull-Cliffs Furnace Co., Sharon Steel Hoop Co., and the A. M. Byers Co., one each.

Of the 12 merchant stacks, seven are in blast and two are being prepared for resumption, as follows—United Iron & Steel Co., two furnaces, one at Sharpsville and the other at Leetonia; Shenango Furnace Co., two at Sharpsville; Stewart Furnace Co., one at Sharon; Reliance Iron & Coke Co., two at Sharpsville. The McKeefrey stack at Leetonia was ordered in blast this week.

The idle furnaces include the Struthers stack, under relining; the Sharpsville Furnace Co. stack, which is being rebuilt, and No. 4 furnace of the Shenango Furnace Co.

Considerable black sheet tonnage has been entered by independents at 3.85c., which represents the price to regular consuming interests. For small tonnages, however, prices from $5 to $7.50 per ton higher have applied.

There is no disposition on the part of tin plate producers in northeastern Ohio to accept new business at the $5.50 price named by the American Sheet & Tin Plate Co. The current spot domestic market is from $6 to $6.25 per base box, with some tonnage for export moving at $6.50.

Several of the tin mills of the Trumbull Steel Co. and of the Falcon Tinplate Co. are operating on tin mill size black sheets, while the ten tin mills comprising the Liberty plant of the Trumbull company are idle.

Coke and coal prices continue weak, due to delay in opening of the navigation season, superior deliveries from the mines and increased output. Steam coal, run-of-mine, is around $2 per ton at the mines. The spot furnace coke market is from $5.50 to$6. Opening of lake navigation is expected to stimulate movement of coal to the Northwest.

The scrap market is also weaker, with heavy melting selling down to $25 and $26, compared with a recent high of $28. Compressed sheets range from $25 to $25.50.

The plate market has settled to a 2.50c. base, with the independents obtaining 2.60c. on some business. There is considerable activity in this branch of the industry. Part of the output of the 132-in. plate mill, the largest in the Mahoning Valley, acquired by the Youngstown Sheet & Tube Co. from the Brier Hill Steel Co., is going into skelp for the Sheet & Tube pipe mills.

Shipments of steel-furniture stock goods in March were the largest since October, 1920, according to figures received by the Department of Commerce thorugh the Bureau of the Census, in cooperation with the National Association of Steel Furniture Manufacturers. Except for the three months, August to October, 1920, inclusive, when prices were higher, the March shipments were the highest on record. Total shipments reported by 22 manufacturers amounted to $1,709,206 in March, as against $1,307,173 in February and $1,087,228 in March, 1922.

Iron and Steel Markets

NEW PIG IRON RECORD

Output Now at 44,000,000 Ton Rate Per Year—Gain of 14 Furnaces

Continued Halt in Buying of Finished Steel—Large Orders for Steel Rails

With the continued halt in new buying of pig iron and finished steel, the returns for pig iron production in April, showing all records again broken, are significant as bearing on the future relation of supply and demand.

At 3,547,551 tons for 30 days the April output compares with 3,523,868 tons for the 31 days of March, the daily rate last month being 118,252 tons, against 113,673 tons a day in March.

We estimate the capacity of the 310 furnaces in blast on May 1 at 119,500 tons a day, against 116,100 tons a day for the 296 furnaces in operation one month previous.

The country is now producing pig iron at a yearly rate of no less than 44,000,000 tons, or more than 10 per cent in excess of the total of 39,434,000 tons in the record year 1916.

Manufacturing consumers of steel are still urgent in their demands upon the mills for deliveries on old orders. But since current market prices are well above those paid for steel now being shipped, it remains to be seen what the country's buying power is at the new contract levels.

More is heard of building projects being put aside because of further advances in labor, as well as the fact that steel deliveries cannot now be made until late in the year. In other directions also there are signs that buyers are not scrambling for material after the manner of 1920, their view being that production will be equal to the demand.

On the other hand, the policy of some sellers is based on the belief that steel production will be affected by the drawing away of labor to outdoor work and later by the high temperatures of the summer months.

Several large rail orders have been placed and others are pending. As deliveries can only be made after the large tonnages placed last fall at $40 have been rolled, the roads are evidently buying now because at $43 rails are lower than other forms of steel. The St. Paul has placed 40,000 tons of rails with the Gary mill and the Illinois Central is reported to have divided 42,000 tons between the Gary and the Ensley, Ala., mills. The Great Northern has bought 7500 tons and the Pere Marquette 5000 tons. The New York Central is inquiring for 150,000 tons.

The Steel Corporation in announcing new contract prices for sheets and tin plate, the former $7 to $8 a ton higher than the last, and tin plates $11 a ton higher, limits deliveries to the third quarter. Already the business booked takes up most of the output for that period, canning requirements of tin plate being large.

The premium prices of Eastern mills on plates and shapes for early delivery have been reduced and there is a closer approach to the contract prices recently announced for third quarter.

The Ford Motor Co., which recently suspended some strip steel deliveries, has now held up shipments on cold finished steel bars as well as bolts, but the significance of this action is not clear, seeing that for some time the company's orders have run more than 25 per cent above its output of 6000 cars a day.

In the pig iron market the halt in buying is more pronounced. Leading merchant furnace interests are well sold ahead, but this is not true of furnaces more recently blown in. Here and there resale iron in dealers' hands has been offered at concessions. Fresh weakness in the coke market has also had some effect on pig iron. Sales of low phosphorus iron in the East at $32 at furnace represent a $3 decline from the last high point.

British ferromanganese has been advanced to $125 at seaboard and the domestic price is likely to follow.

Though railroad equipment ordered from now on may not be completed in time to help fall transportation demands, inquiries for 1507 cars and 132 locomotives have appeared and purchases were closed on 725 cars and 30 locomotives.

The new puddling rate based on bar iron shipments in the 60 days preceding April 20 is $12.12 a ton, an advance of 50c. The bar iron average was 2.35c., as against 2.25c. in the previous 60-day period.

The week's awards of fabricated steel work totaled over 27,000 tons, nearly two-thirds for private enterprises. Conspicuous were 9000 tons for a plate glass subsidiary of the General Motors Corporation and 4000 for the Ford Motor Co. at Iron Mountain, Mich. Inquiries call for 18,000 tons, which does not show the falling off expected.

Copper, lead, tin and zinc markets are softer and all have registered declines within the past week. One producer of lead has made a $5 per ton reduction, due chiefly to Spanish competition.

THE IRON AGE finished steel composite price is at 2.810c. per lb., compared with 2.824c. last week, 2.084c. one year ago and 2.764c. two years ago.

Pittsburgh

No Decline in Consumption—Suspensions of Doubtful Significance

PITTSBURGH, May 1.—Speculative buying of steel having very largely subsided as a result of the fact that the leading producing interests have taken such a strong stand against further advances in prices, the market has taken on an appearance of dullness. Actually, a very fair business still is in progress and there has been no decline in specifications against tonnages already in. These obligations will carry the mills well into the third quarter on most lines and while new buying for that period is not at all heavy, the explanation probably is to be found in a desire on the part of the buyers to await a clearer idea of what is in store for the latter part of the year. Prices have had a very substantial advance over the past year, not only in steel but all other commodities, and there naturally

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	May 1, 1923	Apr. 24, 1923	Apr. 3, 1923	May 2, 1922
No. 2X, Philadelphia‡	$32.76	$32.76	$33.14	$25.40
No. 2, Valley furnace†	31.00	31.00	31.00	23.00
No. 2, Southern, Cin'ti†	31.05	31.05	31.05	21.50
No. 2, Birmingham, Ala.†	27.00	27.00	27.00	17.00
No. 2 foundry, Chicago*	32.00	32.00	32.00	22.00
Basic, del'd, eastern Pa.	30.25	30.25	30.25	23.50
Basic, Valley furnace	31.00	31.00	31.00	23.00
Valley Bessemer, del. P'gh	32.77	32.77	32.77	23.96
Malleable, Chicago*	32.00	32.00	32.00	22.00
Malleable, Valley	31.00	31.00	31.00	23.00
Gray forge, Pittsburgh	32.27	32.27	32.27	24.46
L. S. charcoal, Chicago	36.65	36.65	36.15	28.00
Ferromanganese, furnace	125.00	125.00	125.00	65.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$40.00
Bess. billets, Pittsburgh	45.00	45.00	45.00	32.00
O.-h. billets, Pittsburgh	45.00	45.00	45.00	32.00
O.-h. sheet bars, P'gh	*45.00*	46.00	47.50	31.00
Forging billets, base, P'gh	55.00	55.00	52.00	37.00
O.-h. billets, Phila	50.17	50.17	50.17	36.74
Wire rods, Pittsburgh	51.00	51.00	50.00	38.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.50	2.50	2.35	1.50
Light rails at mill	2.25	2.25	2.25	1.50
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.825	2.825	2.825	1.96
Iron bars, Chicago	2.60	2.60	2.60	1.65
Steel bars, Pittsburgh	*2.40*	2.50	2.50	1.50
Steel bars, Chicago	2.84	2.84	2.84	1.60
Steel bars, New York	*2.74*	2.84	2.84	1.88
Tank plates, Pittsburgh	2.50	2.50	2.50	1.50
Tank plates, Chicago	2.84	2.84	2.84	1.60
Tank plates, New York	2.84	2.84	2.84	1.88
Beams, Pittsburgh	2.50	2.50	2.50	1.50
Beams, Chicago	2.84	2.84	2.84	1.60
Beams, New York	2.84	2.84	2.84	1.88
Steel hoops, Pittsburgh	3.30	3.30	3.30	2.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	May 1, 1923	Apr. 24, 1923	Apr. 3, 1923	May 2, 1922
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	4.00	4.00	4.00	3.15
Sheets, galv., No. 28, P'gh	5.25	5.25	5.25	4.15
Sheets, blue an'l'd, 9 & 10	3.25	3.25	3.25	2.40
Wire nails, Pittsburgh	3.00	3.00	2.90	2.40
Plain wire, Pittsburgh	2.75	2.75	2.65	2.25
Barbed wire, galv., P'gh	3.80	3.80	3.70	3.05
Tin plate, 100-lb. box, P'gh	$6.00	$6.00	$6.00	$4.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	*$26.00*	$26.50	$28.50	$19.50
Carwheels, Philadelphia	*25.00*	26.00	27.00	16.00
Heavy steel scrap, P'gh	*24.50*	25.00	27.00	17.00
Heavy steel scrap, Phila.	*22.00*	23.00	24.50	14.50
Heavy steel scrap, Ch'go	*21.50*	22.00	23.00	15.25
No. 1 cast, Pittsburgh	27.00	27.00	28.00	18.50
No. 1 cast, Philadelphia	25.00	25.00	27.00	18.00
No. 1 cast, Ch'go (net ton)	25.00	25.00	26.50	16.25
No. 1 RR. wrot., Phila.	*25.00*	26.00	28.00	16.50
No. 1 RR. wrot., Ch'go (net)	20.50	20.50	20.50	13.00
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	$6.00	$7.00	$6.00
Foundry coke, prompt	7.00	7.00	8.50	6.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*16.62½*	17.00	17.37½	13.00
Electrolytic copper, refinery	*16.37½*	16.75	17.12½	12.75
Zinc, St. Louis	*6.80*	7.10	7.65	5.02½
Zinc, New York	*7.15*	7.45	8.00	5.37½
Lead, St. Louis	*7.60*	7.90	8.20	5.25
Lead, New York	*7.75*	8.00	8.50	5.40
Tin (Straits), New York	*45.25*	45.62½	47.62½	31.25
Antimony (Asiatic), N. Y.	*7.75*	8.00	8.75	5.37½

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, May 1, 1923, Finished Steel, 2.810c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

April 24, 1923,	2.824c.
April 3, 1923,	2.810c.
May 2, 1922,	2.084c.
10-year pre-war average,	1.689c.

Composite Price, May 1, 1923, Pig Iron, $30.79 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

April 24, 1923,	$30.79
April 3, 1923,	30.86
May 2, 1922,	22.23
10-year pre-war average,	15.72

is hesitancy now, pending the determination of the buying power of the country at the new levels.

Steel now entering consumption carries prices considerably below those currently quoted. In the past week the American Sheet & Tin Plate Co. came out with its third quarter prices on sheets and tin plate, advancing the former $7 to $8 a ton from its previous schedule, and tin plate $11.50 a ton. There has been an increase in cold finished steel bars of $5 a ton since a week ago, this being based on a higher base price for hot-rolled bars and an extra recently announced of $3 per ton for hot-rolled bars of an analysis going largely into cold-finished bars. These changes constitute the only ones in an upward direction lately. Premiums for early delivery are considerably less frequent than they were recently, and it is safe to say that buyers who have tonnages to place representing an actual requirement do not have to go to the recent maximums to secure them.

Semi-finished material remains scarce, but with the edge off the market for early delivery of finished products, demand for the unfinished steel lacks some of its recent urgency. The Ford Motor Co., which suspended considerable tonnage of strip steel, as noted in THE IRON AGE of last week, has in the past week suspended shipments of its May quotas of cold-finished steel bars, and also has taken the same action with its sources of supply of bolts. This development is variously interpreted. It is believed that the business of this company shows no decrease and consequently it should have a place for all the steel it has on order. One report is that it has no less than six weeks' supply of steel on hand, and that shipments are being held up to avoid a congestion, but as the company has sought to have some of the second quarter tonnages deferred to third quarter delivery, some are wondering if the company is not endeavoring to get third quarter supplies at second quarter prices. The Ford Motor Co. for some time observed a buying policy which called for deliveries about three weeks ahead of operating schedules, but on account of mill obligations was forced to change over to entering specifications much further ahead. Opinion is expressed that this company now feels that it can go back to the old plan which was designed primarily to avoid heavy inventories.

There has been little if any let down in steel works operations in this and nearby districts, and there are still only 13 idle blast furnaces out of the 138 in the

triangle bounded by Johnstown, Wheeling and Warren. The Carnegie Steel Co. has blown out one of its Duquesne furnaces, which will be rebuilt and modernized, but a merchant furnace at Leetonia, Ohio, is scheduled to start up today.

Pig iron prices are unchanged, but the market is weak in tone and we record further concessions in prices of scrap while the fuel situation still is depressed by an excess of supply over demand.

Pig Iron.—There has been another week of intense dullness here. Hardly enough business is being done to establish prices, but it is becoming apparent that the advantage is with consumers rather than with producers. Middle interests which bought iron some time ago in expectation of turning it over at a profit have not been successful and are now disposed to seek an outlet. They have quoted basic, Bessemer and No. 2 foundry at $30, Valley furnace, but have been only partially successful in interesting buyers to the extent of purchases at that price, which is $1 a ton below what producers are asking. It is still a safe assertion that the appearance of a really sizable inquiry would induce price concessions by the merchant furnace interests. It is proving rather difficult to advance prices with the coke market weak and with indications that third quarter supplies will be available at prices enough below those of the first and second quarters to offset the higher cost of ore. Some of the coke producers are talking $7 for third quarter furnace fuel, but there has been no business for that period above $6.50, and today there were offers as low as $6. W. P. Snyder & Co. make the average price of basic and Bessemer iron from Valley furnaces in April $31, as against $30.02 for basic and $30.26 for Bessemer in March. THE IRON AGE average for Valley basic and Bessemer for April was $31 for both grades.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$31.00
Bessemer	31.00
Gray forge	30.50
No. 2 foundry	31.00
No. 3 foundry	30.50
Malleable	31.00
Low phosphorus, copper free	36.00

Ferroalloys.—Prices of ferromanganese still are headed higher, due to the fact that costs are rising rather than because of a very big demand. British material has been marked up to $125, c.i.f. Atlantic seaboard, duty paid, for delivery after July 1. while domestic producers want $130, furnace or seaboard, for prompt shipments and $125 for last half deliveries. It is believed, however, that the latter price would be shaded on attractive fourth quarter business. No change is noted in other ferroalloys. The leading commercial producer of spiegeleisen is quoting average 20 per cent material at $40, furnace, but this quotation is nominal, as that interest is pretty completely sold out for the remainder of the year. There is not much demand for this alloy in this district. Interest in 50 per cent ferrosilicon also is low in this territory, since most consumers are covered by contracts and deliveries now are fairly free. Prices are given on page 1287.

Iron and Steel Bars.—The situation in steel bars is unchanged except that there is less demand for very early delivery and consequently only a moderate amount of business at the maximum prices. The Steel Corporation base and that of the leading local independent are 2.40c., while other independents are quoting 2.45c. to 2.50c. Third quarter is generally the best delivery that can be obtained at these prices. Iron bars are unchanged.

We quote steel bars rolled from billets at 2.40c. to 2.75c.; refined iron bars, 3.25c. in carloads, f.o.b. mill Pittsburgh.

Wire Products.—The story this week is much as it has been for some time past; the mills merely are looking out for their regular customers and then only partly beyond tonnages of old orders. Those buyers who must have supplies in a hurry and succeed in interesting other than their regular supply sources find it necessary to pay more than published quotations. But, as a rule, the mills are supplying their customers fairly well and there is not much premium business. Shortage of common labor still is given as the reason why obligations are not being more rapidly reduced and the mills more open for new business. Prices are given on page 1286. Inability of the mills to make deliveries of woven fence promptly enough has resulted in a number of cancellations. The tonnage released from this product will possibly help out production of others. The leading interest still is turning down much early delivery business, but is understood to be in a receptive mood for tonnages for delivery after July 1.

Structural Material.—There is no let-up in the pressure for shipments on old orders, but new business is lighter than it has been, this reflecting the fact that most of the jobs now being taken by shops in this district are for small tonnages and that big projects are held up by the belief that they could not now be placed and put under cover before winter. Some mills can take large structural beams for late July delivery, but August is as prompt as others can make shipments on strictly new orders. The market is hardly quotable above 2.50c: on such deliveries as the mills can make. Prices are given on page 1286.

Semi-Finished Steel.—There is no special change in the situation. It is still rather difficult for finishing mills to secure all the material they require and yet there is not the urgency to the demand there was recently. This condition does not permit prices to move much either way. April will show a smaller production of steel than March, since April was a 25-day month, while the previous month had 27 working days. Observance of Roman and Greek Church Easters also cut into production. We note one inquiry for 4000 tons of sheet bars for June and July delivery and another for 2000 tons a month for June, July, August and September shipment. The market does not appear to be below $45 for billets, sheet bars and slabs for reasonably early delivery, and for prompt shipment is probably not below $46. Small sizes of skelp are hard to secure. Wire rods take the same range as a week ago, but the top price refers to sales to buyers without regular supply connections or to those who would not go to the mills who are selling if regular sources were shipping fully. Prices are given on page 1287.

Steel Rails.—Mills are backward in deliveries of standard rails and are not promising deliveries before Sept. 1 to private industries seeking moderate tonnages. Efforts to get higher prices for light rails are not successful, as the demand largely because of the depressed state of the coal market, which is restricting both operations and development work, is too light.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2.25c. base; standard rails, $43 per gross ton mill for Bessemer and open-hearth sections.

Tubular Goods.—General conditions are much as they have been for several weeks past. Mills all have heavy order books and are still obliged to apportion production since current output is insufficient to give all buyers all the tonnage they want. Advances recently announced still are several weeks away as far as applying them is concerned. On an average, the bookings were equal to 60 days production when the changes were announced. Discounts are given on page 1286.

Bolts, Nuts and Rivets.—Buyers are specifying well against contracts, but there is only a fair amount of new buying, this representing largely the rounding out of stocks. Bolt makers in this district run more to railroad requirements and are not much affected by the suspension of May shipments by Ford Motor Co. Prices and discounts are given on page 1286.

Track Fastenings.—Prices here are unchanged. New demands usually are for small lots, but that is all that makers can accept in view of the fact that they still have much unfilled business. Prices are given on page 1286.

Cold-Finished Steel Bars and Shafting.—Recent

advance in the base price of hot-rolled bars, coupled with a $3 per ton extra on bars for cold-finishing, finds reflection in an advance of $5 a ton in cold-finished bars and shafting to 3.25c. base, Pittsburgh, for carload lots, the new price becoming effective April 30. Ground shafting takes a similar advance, now being quoted at 3.65c., base, f.o.b. mill, for carload lots. New demands are lighter than they were recently, but generally specifications are coming along freely on old orders. The Ford Motor Co. has no less than six weeks' supply of steel on hand and is holding up May shipments.

Plates.—Recent inquiry for the Pressed Steel Car Co. for about 17,000 tons has been only partly placed, since few makers have any open capacity for the next few months and prefer small orders carrying the full price rather than this one which the buyer seeks to place below the current quotation. Delivery premiums involve only moderate tonnages. Prices are given on page 1286.

Sheets.—The American Sheet & Tin Plate Co., on April 24, announced its sheet prices for third quarter. They are 3.85c., base, for black; 5c., base, for galvanized; 5.30c., base, for long ternes; 5.35c., base, for automobile body stock (No. 22 gage), and 3c., base, for blue annealed. These prices represent advances of $7 to $8 per ton over the schedules set up Feb. 26, but are $10 to $13 a ton over the prices first named for first half of 1923 contracts. Whether considered from the Feb. 26 scale or the earlier ones, the latest prices represent the largest advance ever made at one time by the leading interest. New extras for size and quantity also have been adopted, which further increase prices of a number of unusual sizes, the aim being to avoid such business, while small lots of a size also will cost the buyer more. There is some talk of quoting two bases on blue annealed sheets, one for No. 12 gage and lighter and another for No. 10 gage and heavier. Some of the independents who make a practice of selling ahead will probably adopt the prices of the leading interest, but so long as orders can be obtained, others will continue their present policy of selling only for brief periods. The prompt delivery market is little if any easier than it has been, because the Steel Corporation prices are for third quarter tonnages and few of the independents have much tonnage for delivery promptly. We still regard the early deliverery market as quotable from 4c. to 4.25c. for black, 5.25c. to 5.50c. for galvanized and 3.25c. for blue annealed. Official quotations on automobile body sheets are for third quarter, not prompt delivery. Prices are given on page 1286.

Tin Plate.—The new price of $5.50 per base box, Pittsburgh, for standard coke tin plate, announced by the American Sheet & Tin Plate Co., April 24, is in line with expectations of most of the trade and verifies the forecast of THE IRON AGE of last week. The price is for the third quarter only, which is an innovation for the leading interest, which hitherto has quoted for six months to manufacturing consumers. It is likely that independent makers also will quote this price to the makers of packers' cans, since their customers cannot be placed at a disadvantage with those of the Steel Corporation. Less than half of the product of independent mills, however, goes to makers of packers' cans and the new price, not being regarded as low, will hardly be observed on the remainder of their tonnage. The new price is $10 a ton below the early delivery quotation, but is $11 a ton above the last previous price of the Steel Corporation and $15 a ton above its price named for first half business. Supplies for early delivery still are hard to secure at less than $6 per base box.

Hot-Rolled Flats.—Prices are not quotably changed from those of the past few weeks. A number of mills have orders or are reserving tonnages for regular customers to an extent that they are virtually out of the market; such mills are naming 3.50c., base, on the easily rolled sizes and gages and 3.75c. for light, narrow stock, but others, still open for business at 3.30c., base, are even shading that price slightly to round out a schedule. Suspensions by a large automobile company in hot-rolled strips do not amount to much. Makers of cotton ties already have begun to roll them in preparation for future demands. If the price of cotton determines the acreage, it should be large this year. Prices of hot-rolled flats are given on page 1286.

Cold-Rolled Strips.—Some business calling for very early shipment lately has been placed as high as 6c., base, Pittsburgh, but on the bulk of current acceptances, 5.50c. is maximum, and some makers still are taking on business at 5.25c., base. Much May tonnage will be free as a result of the action of the Ford Motor Co. in suspending May shipments.

Coke and Coal.—Although there has been some curtailment of production in the Connellsville district, current offerings of coke still are in excess of demand and prices remain easy. Furnace coke is quotable for spot delivery anywhere from $5.50 to $6.25 per net oven, and foundry coke from $6.50 to $7.50, but the minimum prices in both cases refer to small tonnages which shippers have to move and the more common minimum prices are $6 for furnace grade and $7 for foundry coke. Pig iron producers are casually inquiring about third quarter tonnages, but no actual business of any consequence yet has been done. As low as $6 was quoted today, but most oven operators are seeking $6.50 to $7, being encouraged to hold for these prices by suggestion that an advance in pig iron to $35 is an early possibility. Inquiry for coal is better, although there has been no material increase in actual business. It looks as though Lake movement would be under way in a few weeks, and an effort is being made to tie up some of the producers while prices are still low. The spot market on mine run steam coal still is quotable from $1.75 for Fairmont coal to $2.25 for Pittsburgh seam, and from $2.50 to $2.75 for gas and coking coal.

Old Material.—Prices still show a sagging tendency and average about 50c. lower than last week. Melters generally are showing little interest in the market and dealers find that it does not avail much to offer material at concessions. Weakness in outside markets is not without effect upon the demand, while railroad lists are running heavy. The Pennsylvania Railroad offers more than 50,000 net tons of scrap in its May lists. Labor shortages are expected as the weather grows warmer and this will curtail steel works, operations and prolong the existence of stocks. A feature of the situation in steel works' grades is that compressed sheets are valued almost as highly as heavy melting steel. Some mills prefer compressed sheets at even money to the heavy melting steel now being shipped. The Westinghouse Electric & Mfg. Co. May offerings of this material brought close to $24, East Pittsburgh.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton

Heavy melting steel		$24.50
No. 1 cast, cupola size	$27.00 to	27.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; and Franklin, Pa.	26.00 to	26.50
Compressed sheet steel	24.00 to	24.50
Bundled sheet sides and ends	22.00 to	22.50
Railroad knuckles and couplers	27.00 to	27.50
Railroad coil and leaf springs	27.00 to	27.50
Low phosphorus standard bloom and billet ends	31.00 to	32.00
Low phosphorus, plates and other grades	27.50 to	28.00
Railroad malleable	25.00 to	25.50
Steel car axles	28.00 to	28.50
Cast iron wheels	26.00 to	27.00
Rolled steel wheels	27.00 to	27.50
Machine shop turnings	20.00 to	20.50
Heavy steel axle turnings	22.00 to	22.50
Short shoveling turnings	20.50 to	21.00
Cast iron borings	21.50 to	22.00
Heavy breakable cast	24.00 to	24.50
Stove plate	20.50 to	21.00
Sheet bar crop ends	29.00 to	30.00
No. 1 railroad wrought	20.00 to	20.50

Chicago

Buying Has Slackened but Some Activity Has Arisen in Rails

CHICAGO, May 1.—Steel buying has slackened materially and the view is gaining ground among consumers that prices will advance little, if any, above present levels and that there is no advantage in placing additional orders for extended delivery. This change in the attitude of their trade has not perturbed the mills, which have heavy forward bookings and are convinced of the fundamental soundness of the business situation as reflected in heavy consumption. Their view is that a pause in activity was to be expected after the liberal purchases of the last nine months. The feature of the market which impresses them is that steel consumption continues to increase in the same ratio as production, and pressure for more liberal shipments grows even more insistent as the season advances. The railroads, particularly, are anxious to get deliveries of their rails, track fastenings and cars in time to turn them to advantage. In fact, an important reason for the recent falling off in new freight car orders is the inability of car builders to deliver them in time for the fall grain and coal movements. While a number of large rail orders have been placed and others are pending, this buying is probably accounted for not by delivery considerations but by the relatively low price of rails as compared with other steel commodities. The rails which will be laid this year were ordered last fall.

The price situation shows little change and while sales at premium prices are fewer than some weeks ago, no actual weaknesses have developed except in light rails and track spikes and bolts. Competition from mills rerolling light rails has been rather sharp, and in neutral territories Eastern makers of spikes and bolts have taken business away from local producers.

The general operating situation is substantially unchanged. The leading interest has gained slightly while the foremost independent has lost. The Illinois Steel Co. put in its last blast furnaces at Gary, having 12 active stacks at that works for the first time in three years. It continues to operate 10 blast furnaces at South Works, 3 at Joliet and a small merchant stack at Milwaukee. Its steel output is possibly 1 or 2 per cent above the average of last week. The Inland Steel Co. is running its mills at 70 to 80 per cent. The belief is current that production will not reach its present high level again until some time in the fall. Not only is some labor being lost as outdoor work opens up, but it is well known that the efficiency of mill hands is reduced by the heat of the summer months. This is particularly true in the sheet mills.

Ferroalloys.—Ferromanganese for last half delivery has been advanced by some sellers to $127.50, seaboard, but the price of $125 has not entirely disappeared. Several inquiries for spiegeleisen ranging from carload lots to 200 tons are current but the material is difficult if not impossible to obtain from any source. A local buyer with plants throughout the country has bought 300 tons of 14 to 16 per cent Bessemer ferrosilicon at a price equivalent to about $55.50, delivered, Chicago.

We quote 80 per cent ferromanganese, $127.56 for deferred delivery and $137.56 for early shipment; 50 per cent ferrosilicon, $95, delivered.

Coke.—Beehive foundry coke has weakened and for spot delivery is offered at $6.50 to $7.50, Connellsville. Local by-product foundry remains unchanged at $15, Chicago switching district.

Pig Iron.—The market is exceptionally quiet, but no weakness in prices has developed and none is looked for. Furnaces have heavy bookings and have no reason to be concerned about additional business at this time There have been a few sales of 200 to 300 tons of foundry iron, but on the whole buying has been very light. A local melter is inquiring for 1000 tons of foundry iron for delivery within the next 60 days, while a Milwaukee plant wants 500 tons of foundry for third quarter. A local plant has purchased 100 tons of high silicon malleable iron for May shipment. A Michigan user has closed for 200 tons of 8 per cent silvery at the Jackson County schedule. In view of the lack of sales within the past few weeks the quotation on low phosphorus carried below is to be regarded as nominal.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.65
Northern coke, No. 1, sil. 2.25 to 2.75	$33.00 to 34.00
Northern coke, foundry No. 2, sil. 1.75 to 2.25	32.00 to 33.00
Malleable, not over 2.25 sil.	32.00 to 33.00
Basic	32.00 to 33.00
High phosphorus	32.00 to 33.00
Southern No. 2	33.01
Low phos., sil. 1 to 2 per cent copper free	36.00 to 37.00
Silvery, sil. 8 per cent	44.29

Rails and Track Supplies.—The Chicago, Milwaukee & St. Paul has placed 40,000 tons of rails with the Gary mill and another road with headquarters here is reported to have divided 42,000 tons between the Gary and Tennessee mills. The Great Northern has placed 7500 tons with the Illinois Steel Co. and 2500 tons with Inland Steel Co. The Pere Marquette has ordered 5000 tons from the Bethlehem Steel Co. The New York Central is inquiring for 150,000 tons. Little new business in track supplies has been placed, but April sales of light rails showed a gain over the three previous months of the year.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.
Standard railroad spikes, 3.25c. mill; track bolts with square nuts, 4.25c. mill; iron tie plates, 2.85c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.
Jobbers quote standard spikes out of warehouse at 3.80c. base and track bolts, 4.80c. base.

Plates.—Purchases of railroad cars and oil storage tanks have declined sharply and new demand for plates has diminished. While pressure for deliveries is no less insistent than heretofore, there appears to be a growing conviction among buyers that prices will go little, if any, higher and that there is no advantage in placing further orders for remote delivery. The price situation shows no change with the leading local mill taking business for indefinite shipment only and producers east of here offering specific deliveries at 2.50c., base, Pittsburgh. The Inland Steel Co. remains out of the market and does not expect to open its books for third quarter until May 15 or possibly later. The United Iron Works, Kansas City, has placed 1000 tons of plates with a local mill to be applied against an order for oil storage tanks from the Roxana Petroleum Co.; the tanks will be erected in Oklahoma.

The mill quotation is 2.60c., Chicago, for indefinite delivery and 2.84c. to 3.19c. delivered Chicago for specific shipment. Jobbers quote 3.30c. for plates out of stock.

Structural Material.—Notwithstanding recent evidences of diminishing activity in the construction field, fabricating awards for the week were very heavy, involving a total of over 19,000 tons. The largest single letting, 9000 tons, went to the Mississippi Valley Structural Steel Co. and goes into a new plant at Ottawa, Ill., for the National Plate Glass Co. a subsidiary of the General Motors Corporation. Plain material prices remain unchanged.

The mill quotation on plain material is 2.60c., Chicago, for indefinite delivery. We quote 2.84c. to 3.19c. delivered Chicago for plain material for specific shipment. Jobbers quote 3.30c. for plain material out of warehouse.

Bars.—There has been a general change in the attitude of buyers of soft steel bars. Pressure for deliveries is unrelaxed and consumption gains with each increase in mill production, yet there is no longer any anxiety to get additional orders on mill books for extended delivery, as it is felt that prices will rise little if any above the present levels. At the same time industrial activity remains as widespread as ever. Production schedules of automobile manufacturers continue to increase and demand from jobbers and rein-

forcing bar dealers is heavy. Farm implements makers are operating at from two-thirds to three-fourths of capacity and are enjoying a much better trade than was expected in view of discouraging reports which had been received from agricultural sections. Demand for bar iron is steady but not excessive and prices remain unchanged. A large part of the output of the rail steel bar mills is going into reinforcing bars, although there continues to be a satisfactory demand from bedstead makers, fence post manufacturers and implement companies.

Mill prices are: Mild steel bars, 2.50c., Chicago, for indefinite delivery and 2.84c. to 3.19c. for specific delivery; common bar iron, 2.60c. to 2.75c., Chicago; rail steel, 2.30c. to 2.40c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4.30c. for rounds and 4.80c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 3.15c. base; hoops, 4.55c.; bands, 3.95c.

Wire Products.—The leading interest has opened its books for third quarter at the advanced prices which it tentatively announced last week, as published in the Pittsburgh market letter. The company can take no further business for second quarter and in fact a large part of its present bookings will probably overlap into third quarter. For mill prices see finished iron and steel f.o.b. Pittsburgh, page 1286.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, $3.95 per 100 lb.; cement coated nails, $3.40 per keg.

Cast Iron Pipe.—Prices are stronger, particularly in the smaller sizes. For 6 to 12 in. the going market appears to be a minimum of $52, base Birmingham, while for larger than 12 in. it ranges from $50 to $51. The United States Cast Iron Pipe & Foundry Co. has booked 2200 tons for Moriemont, near Cincinnati, and 730 tons for Jackson, Mich. The National Cast Iron Pipe Co. will furnish 385 tons for Altamont, Ill. Sheboygan Falls, Wis., takes bids today on 175 tons of 6-in. Class B, while Springfield, Ill., will receive tenders tomorrow on 100 tons of 6-in. Class C.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $64.20; 6-in. to 12-in., $60.20; above 12-in., $58.20 to $59.20; class A and gas pipe, $5 extra.

Bolts and Nuts.—Specifications are coming in steadily, although not in heavy volume, as was the case just prior to the close of the last quarter. New business is also up to expectations and the situation on all sides is regarded as favorable by sellers. The discounts of March 1 continue to rule in this district. The minimum going quotation on structural rivets appears to be 3.35c., Chicago, while boiler rivets are 10c. per 100 lb. higher.

Jobbers quote structural rivets, 4c.; boiler rivets, 4.10c.; machine bolts up to ¾ x 4 in., 45 and 5 per cent off; larger sizes, 45 and 5 off; carriage bolts up to ¾ x 6 in., 40 and 5 off; larger sizes, 40 and 5 off; hot pressed nuts, squares and hexagons, tapped, $2.50 off; blank nuts, $2.50 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off.

Sheets.—The leading interest has opened its books for third quarter at 3c., base Pittsburgh, for blue annealed, 3.85c. for black and 5c. for galvanized. The local independent will not announce its third quarter prices until May 15, if that soon. Mills east of here selling for second quarter delivery are obtaining higher prices than those announced by the Steel Corporation subsidiary. In this territory, however, demand for sheets is less active than for plates, shapes and bars.

Mill quotations are 3.85c. to 4.25c. for No. 28 black, 3c. to 3.25c. for No. 10 blue annealed and 5c. to 5.25c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4.35c. for blue annealed, 5.20c. for black and 6.35c. for galvanized.

Reinforcing Bars.—Recent advances in local mill prices have been reflected in higher warehouse prices for concrete bars. Effective May 1, local sellers raised reinforcing bars $3 a ton to 3.15c. base, per lb. local warehouse. There has been a rush to place business at the old prices, although sellers have been cautious about adding to their commitments because of continued slow deliveries from the mills. Possibilities of a decline in new projects are seen owing to a growing disinclination on the part of the bankers to finance further hotel and apartment house construction in this city. The Fair Store addition, Chicago, bids on the general contract of which were taken May 1, will involve 700 tons of bars instead of 490 tons as previously reported.

Recent lettings include:

Cook Estate Hotel, Omaha, Neb., 300 tons to Concrete Steel Co.

Plant addition for Gossard Corset Co., Chicago, 250 tons to Kalman Steel Co.

L. & A. Textile Co. plant addition, Kenosha, Wis., 250 tons to Concrete Steel Co.

Club building, 1244 North Dearborn Street, Chicago, 300 tons to Corrugated Bar Co.

Green Bay High School, 200 tons to Kalman Steel Co.

Hotel LaSalle garage, Chicago, 200 tons to Joseph T. Ryerson & Son.

Champaign County, Ill., road work, 300 tons to Truscon Steel Co.

Illinois road work, 150 tons to Kalman Steel Co.

La Crosse Plumbing & Supply Co. building, La Crosse, Wis., 100 tons to Kalman Steel Co.

Wisconsin road work, 100 tons to Kalman Steel Co.

Illinois road work, 100 tons to Truscon Steel Co.

Pending work includes:

Blayney-Murphy Packing Co. packing house, Denver, Colo., 500 tons.

Warehouse Prices.—Local jobbers have advanced blue annealed and black sheets $4 a ton to 4.35c base and 5.20c base, respectively, f.o.b. local warehouse, and galvanized sheets $5 a ton to 6.35c per lb. base, f.o.b. local warehouse. Warehouse prices on concrete bars have gone up $3 a ton to 3.15c, Chicago store.

Old Material.—Heavy supplies of both mixed and prepared scrap continue to be thrown on the market from all sources. Offerings by the railroads are particularly heavy. Prices have again given way, and while there is scattered buying by consumers, the natural propensity is to purchase sparingly on a declining market. Toward the close of last week a local steel mill bought a substantial tonnage of heavy melting at $22, delivered, but this is the only sale of any consequence reported. The Chicago & Northwestern offers 7800 tons, of which 1000 tons is No. 1 wrought; the Pennsylvania, Southwestern Region, offers 7300 tons; the Burlington 6000 tons, and the Pennsylvania, Northwestern Region, 3200 tons. The problem of brokers is how to absorb the large quantities of material coming on the market. They are fast filling their old contracts with consumers and hesitate to make new purchases on a declining market without first finding buyers for the scrap. There is, therefore, an increasing pressure to sell, with the result that the prices are being forced downward step by step.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$25.00 to $26.00
Cast iron car wheels	26.00 to 26.50
Relaying rails, 56 and 60 lb.	28.50 to 29.50
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	27.00 to 27.50
Rails for rolling	23.00 to 23.50
Steel rails, less than 3 ft.	24.50 to 25.00
Heavy melting steel	21.50 to 22.00
Frogs, switches and guards cut apart	21.50 to 22.00
Shoveling steel	21.00 to 21.50
Drop forge flashings	18.00 to 18.50
Hydraulic compressed sheets	18.50 to 19.00
Axle turnings	19.00 to 19.50

Per Net Ton

Iron angle and splice bars	25.50 to 26.00
Steel angle bars	21.00 to 21.50
Iron arch bars and transoms	25.50 to 26.00
Iron car axles	30.00 to 30.50
Steel car axles	24.00 to 24.50
No. 1 busheling	18.50 to 19.00
No. 2 busheling	13.50 to 14.00
Cut forge	19.00 to 19.50
Pipes and flues	15.00 to 15.50
No. 1 railroad wrought	19.50 to 20.00
No. 2 railroad wrought	19.00 to 19.50
Steel knuckles and couplers	24.00 to 24.50
Coil springs	25.00 to 25.50
No. 1 machinery cast	25.00 to 25.50
No. 1 railroad cast	23.00 to 23.50
No. 1 agricultural cast	23.00 to 23.50
Low phos. punchings	20.50 to 21.00
Locomotive tires, smooth	21.50 to 22.00
Machine shop turnings	14.00 to 14.50
Cast borings	15.50 to 16.00
Short shoveling turnings	15.50 to 16.00
Stove plate	20.00 to 20.50
Grate bars	20.00 to 20.50
Brake shoes	20.00 to 20.50
Railroad malleable	24.00 to 24.50
Agricultural malleable	23.00 to 23.50

New York

Halt in Pig Iron Buying Continues—Lower Prices for Coke

NEW YORK, May 1.—In both pig iron and finished material quietness of the past two weeks continues. There is an easier condition in pig iron, but without distinct development of weakness, as there is no disposition to press sales and shipments on contracts continue in good volume except where embargoes prevent. The prompt coke market is weaker. There is no discussion of the third quarter contract basis as yet. While $7.25 and $7.50 was paid for blast furnace coke now being delivered, it is probable that $6.50 would be accepted for third quarter.

Pig Iron.—Some sales of Buffalo iron are reported on $29 basis, although other makers in that district are asking $29.50. The American Locomotive Co. has closed for 2100 tons of high manganese iron for Schenectady, the business going to an eastern New York furnace on a basis that would have meant close to $28.50 at furnace for Buffalo competition. A Jersey City company that inquired last week for 300 tons of high phosphorus and low manganese iron closed for about 500 tons. Whatever deviation there may be from the $31 basis for eastern Pennsylvania iron is credited to resales by brokers who bought originally below today's level. New England embargoes, limiting shipments to main line points on the New Haven road, are still in force.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$34.27 to $35.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	33.27 to 34.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	32.27 to 33.27
Buffalo, sil. 1.75 to 2.25	33.41 to 33.91
No. 2X Virginia, sil. 2.25 to 2.75	34.94
No. 2 Virginia, sil. 1.75 to 2.25	34.44

Ferroalloys.—American agents of British producers of ferromanganese have received cables from their principals advancing the price per ton to $125, c.i.f. Atlantic seaboard, an increase of $5. This is for delivery from September to December. The leading domestic producer, when quoting, which is seldom, names as its minimum $125 f.o.b. furnace or seaboard, according to destination. Spiegeleisen is scarce and only odd lots of the imported are available for prompt shipment, and such material is quoted at $55 per ton, f. o. b. cars seaboard. Fifty per cent ferrosilicon is quoted at a minimum of $95, delivered, for prompt or second half, either foreign or domestic. Prices of other ferroalloys and ores are given on page 1287.

Cast Iron Pipe.—The market continues active and prices firm. There is a heavy demand for all sizes and deliveries are long delayed. Fitchburg, Mass., on bids opened April 25, awarded about 800 tons of 20-in. water pipe to the Warren Foundry & Machine Co. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $58.50; 4-in. and 5-in., $63; 3-in., $68.80, with $4 additional for Class A and gas pipe. The soil pipe market is quiet, jobbers in a majority of cases being covered with contracts that will provide deliveries over the next two months. Because of the railroad embargoes in the New England district and the difficulty in obtaining permits for shipments, jobbers in that section still have fair tonnages due them on old contracts. We quote discounts on soil pipe of both Southern and Northern makers, delivered New York, as follows: 2 to 6-in. standard, 13 to 15¾ per cent off list; heavy, 23 to 25¾ per cent off list.

Warehouse Business.—Business continues very active in practically all lines, but particularly plates and structural material. Some large consumers of plates have asked for warehouse delivery because of the slow deliveries by mills and the greatest difficulty is in obtaining sufficient material. Both black and galvanized sheets are firmer than for some time. One warehouse carrying cold rolled shafting and screw stock has increased prices 25c per 100 lb. and other warehouses will probably also advance quotations. We quote a range of 4.40c. to 4.65c. per lb. on rounds and 4.90c. to 5.15c. per lb. on squares, flats and hexagons. Black sheets are still quotable at 5.10c. to 5.50c. per lb. base and galvanized at 6.10c. to 6.50c. per lb. base. No change is reported in brass and copper prices. We quote prices on page 1316.

Coke.—Both furnace and foundry coke continue to show weakness, particularly the former, which for standard grades ranges from $5.75 to $6 per ton, with medium and higher sulphur cokes considerably lower. Accumulations are due to embargoes in Eastern territory. While standard foundry coke is quoted as low as $6.75 per ton, prices on brands range up to $7.50 per ton and higher.

Old Material.—No improvement is yet evident in the scrap market. Mills are still not inclined to make contracts and most dealers are out of the market for the present, although there is some expectation that buying will be resumed the latter part of this week. For delivery to eastern Pennsylvania on No. 1 heavy melting steel the price is about $21 with some buying at this price for Coatesville, Conshohocken and Claymont. Delivered to mills in western Pennsylvania, the quotation is not to exceed $23 per ton for heavy melting steel. Dealers buying for delivery to Bethlehem will not pay more than $20.50 per ton delivered for railroad grade. The buying price New York ranges from $17 to $17.50 per ton for No. 1 heavy melting steel with railroad quality at $17.50 to $18 per ton. Stove plate is quiet with $19 to $19.50 per ton being offered delivered Perth Amboy. A consumer in Bridgeport is only offering $19 per ton delivered on stove plate. Specification pipe is inactive. Some shipments are reported to Duncannon, Pa., at $18.50 per ton delivered and Lebanon shipments are only on old contracts. Some heavy machine shop turnings have been shipped to Perth Amboy at $19 per ton delivered but this grade is also quiet. For delivery to Monessen, borings and turnings have brought $20.50 per ton.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$17.00 to $17.50
Steel rails, short lengths, or equivalent	17.50 to 18.00
Rails for rolling	22.00 to 23.00
Relaying rails, nominal	29.00 to 30.00
Steel car axles	24.00 to 25.00
Iron car axles	26.00 to 27.00
No. 1 railroad wrought	20.00 to 21.00
Wrought iron track	17.50 to 18.00
Forge fire	15.00 to 15.50
No. 1 yard wrought, long	19.00 to 19.50
Cast borings (clean)	15.50 to 16.00
Machine-shop turnings	15.50 to 16.00
Mixed borings and turnings	14.50 to 15.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	13.50 to 14.50
Stove plate	17.00 to 17.50
Locomotive grate bars	17.50 to 18.00
Malleable cast (railroad)	21.00 to 22.00
Cast-iron car wheels	22.00 to 23.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$24.50 to $25.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	23.50 to 24.00
No. 1 heavy cast, not cupola size	21.50 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	19.50 to 20.00

Finished Iron and Steel.—Each week brings new evidence that buyers are in a waiting mood so far as new business is concerned, although this attitude is more noticeable on some products than others. In pipe, sheets and tin plate the situation is unusually strong and there is little doubt that the mills could sell all that they will produce this year if they were willing to book the business at this time. A tendency on the part of some of the independent tin plate producers to limit contracts to three months does not altogether find favor among consumers, who likewise frowned upon the six months' contract on the ground that they must anticipate their requirements for a year to take care of the food packing industries. One large independent has followed the American Sheet & Tin Plate Co. in naming $5.50 per base box on tin plate, but an Eastern producer has delayed in naming its price. In sheets there is no disposition among independent mills to follow the prices of the American Sheet & Tin Plate Co. for third quarter as these prices are lower than independent mills have been getting. It is fairly easy

to obtain 3.25c. for blue annealed, 4c. for black and 5.25c. to 5.50c. for galvanized, f.o.b. Pittsburgh, when good deliveries can be offered. In plates, shapes and bars there is an easing up. Bars are more freely available at 2.50c., Pittsburgh, and while the deliveries are not of the best, sometimes as long as three months, consumers show a disposition to cover. In plates a leading Eastern producer has created a new situation by offering sheared or universal at 2.60c., Pittsburgh, for delivery in two or three weeks. In structural shapes the falling off in new building projects has brought about a slight change in that the peak of premium prices obtained recently by Eastern mills are off $2 a ton. One mill which had held firmly at 2.85c., mill, has made sales at 2.75c.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c. to 2.84c.; plates and structural shapes, 2.84c.; bar iron, 2.84c.

Buffalo

Nearby Furnaces Cut Prices Sharply, While $29.50 Rules in Buffalo Iron

BUFFALO, May 1.—Not any of the Buffalo sellers of pig iron see an immediate lifting of the buying slump in the immediate future notwithstanding that surveys of the trade indicate large melting activity and that not all third-quarter requirements have been filled. Reports of $29, Buffalo, for silicon 1.75 to 2.25 on New England business are not confirmed here; all the producers insist that the lowest quotation for No. 2 plain is $29.50. The explanation seems to be that at least two New York State furnaces, one not far from Buffalo, are quoting $1 to $2 under the Buffalo price, which is maintained at $29.50 for No. 2 plain. Some concessions have, however, been made on higher silicons; a brokerage office has dropped its price on No. 1 foundry from $31 to $30.50, but the reduction has not affected the base price. The 2000-ton inquiry which engaged several offices last week has been placed outside the district where a more advantageous freight rate affected the purchase. Neither sales nor inquiries are any livelier. If anything, there is less interest than previously. One furnace sold 500 tons of silicon 3.25 to 3.75 at $32.50 furnace. Malleable holds firm at $30.00.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$30.50
No. 2X foundry, 2.25 to 2.75 sil.	30.00
No. 2 plain, 1.75 to 2.25 sil.	29.50
Basic	30.00
Malleable	30.00
Lake Superior charcoal	37.28

Finished Iron and Steel.—Several selling factors find an abatement of demand or rather it is described as a lessening of the tension in placing business. Labor shortages at the mills have affected production of finished material and thus released tonnages of semi-finished material with special reference to plates and skelp. Announcement of new sheet prices by the Steel Corporation was followed by the local branch of an independent and third quarter books are now open for allotments of tonnages to old customers only and on the same basis as the corporation. Bar users are not pressing mills as hard; a local independent is taking business subject to 90 days delivery at a minimum price of 2.50c. That conditions with buyers have changed is indicated in the fact that some consumers are buying on the 90-day schedule, whereas two months ago 30-day delivery was sought. Independent prices on tinplate have not reached Buffalo offices but it is generally felt $5.50 is not enough and that new prices will be higher than the corporation. Two independents are now quoting bars at 2.40c and shapes and plates at 2.50c. A Buffalo maker is quoting bars at 2.50c. and shapes and plates at 2.60c.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5.10c.; cold rolled round shafting, 4.45c.

Coke.—Demand is slight; inquiry has fallen off in a marked way. Good foundry grades can be purchased at $7.00 to $7.50, ovens.

Old Material.—With the exception of borings and turnings, which are in good demand by blast furnace interests, weakness has developed in other materials and very little activity is going on. Prices have sagged. Mills are not interested and are not likely to be unless further price weakness develops. Rejections of steel have been unusually heavy and indicate consumers are well stocked.

Heavy melting steel	$23.50 to $24.00
Low phos., 0.04 and under	27.00 to 28.00
No. 1 railroad wrought	21.00 to 21.50
Car wheels	23.00 to 23.50
Machine shop turnings	18.00 to 19.00
Cast iron borings	20.00 to 21.00
No. 1 busheling	21.50 to 22.00
Stove plate	21.00 to 22.00
Grate bars	20.00 to 21.00
Bundled sheet stampings	16.00 to 17.00
No. 1 machinery cast	24.50 to 25.50
Hydraulic compressed	22.00 to 22.50
Railroad malleable	27.00 to 28.00

Cleveland

Sheets, Bars and Slabs at $45—Lull in Pig Iron Market Continues

CLEVELAND, May 1.—The lull in the pig iron market continues. Sales during the week were limited to a few small lots and little new inquiry came out. A little demand has sprung up for foundry iron for early shipment from foundries that are not getting deliveries as fast as needed from local sources of supply. One producer during the week sold 1000 tons in several lots. New inquiries are pending for about 2500 tons of foundry and malleable iron for the third quarter, including one from Springfield for 500 tons and one from Dayton for 600 tons. Many foundries are complaining of a shortage of molders, which is restricting their operations. Prices are virtually unchanged. Foundry and malleable iron are quoted at $31 in the Valley district and $31.50 by Lake furnaces, although one Cleveland producer is asking $32 for the third quarter. Steel making iron is inactive.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron includes a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$31.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$32.15 to 32.77
Southern fdy., sil. 1.75 to 2.25	33.00
Malleable	32.15 to 32.77
Ohio silvery, 8 per cent	42.52
Standard low phos., Valley furnace	35.00 to 36.00

Iron Ore.—Two boats arrived at Escanaba Sunday for ore and the first cargoes of the season will probably be shipped from that port late in the week. Ice conditions in Lake Superior are still bad and it is uncertain when the ore movement will start from the head of the Lakes. The mines have been making shipments for several days and there is now considerable ore at the upper lake ports awaiting the opening of the shipping season. Following the advance of 10c. a ton in the vessel rate on ore to 80c. from the head of the Lakes, as announced last week, rates from other ports have been fixed. These are 72c. from Marquette and 60c. from Escanaba to Lake Erie ports, and 48c. from Escanaba to South Chicago.

Alloy Steel.—Little if any business in alloy steel for the third and fourth quarters has as yet been placed by the automobile companies and steel makers have not definitely committed themselves on prices for that delivery. However, mills have considerable tonnage on their books that will be carried into the third quarter. Prices have advanced ¼c. per pound on chrome vanadium and chrome molybdenum steels.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts are heavy and there is a fair volume of new business. Several manufacturers are still quoting the discounts that prevailed before the 10 per cent advance. Rivet specifications are heavy and prices are a little firmer, although 3.25c. for structural and 3.35c. for boiler rivets are still the prevailing local quotations.

Semi-finished Steel.—The sale of 6000 tons of slabs at $45, Youngstown, for early shipment is reported, and sheet bars are quoted at $45 to $46, although one mill is holding to $47.50 for sheet bars, billets and slabs, and reports that it is turning down offers of tonnage at that price. An Eastern mill is now asking $50 for forging billets.

Sheets.—The announcement of the Steel Corporation prices for the third quarter seems to have had no effect on prices of independent producers. Black sheets have apparently settled down to 3.85c., at which they can be bought for early shipment, although some mills are asking 4c. A local mill has advanced blue annealed sheets to 3.40c. for May shipment, although a Valley producer quotes these at 3c. for heavy gages and 3.25 for light gages. Galvanized sheets are commonly quoted at 5c.

Reinforcing Bars.—The demand is not as active as it has been. The Concrete Steel Co. has taken 250 tons for the Martin Store, Portsmouth, and 175 tons for a bakery in Toledo. Inquiry is pending for several hundred tons for a bakery in Buffalo and for 100 tons for the McCrory Store Building in Springfield. Rail steel bars are unchanged at 2.50c.

Warehouse Business.—There is a heavy demand on warehouses for steel, particularly for structural material in quantities up to carload lots. Prices are unchanged.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 9 galvanized wire, 3.70c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.90c.; No. 10 blue annealed sheets, 3.90c. to 4.06c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.60c.

Finished Steel.—New demand has further declined and is limited mostly to small lots. However, the consumption continues heavy and consumers are crowding the mills for shipments, this being particularly true of plates and structural material. The demand from the automobile parts manufacturers shows no decline. The only definite price change is a $5 a ton advance to 3.25c. on cold-rolled steel. There is a range from 2.50c. to 3c. in quotations by independent mills on plates for early delivery, the higher price being for quick shipment. Small Ohio mills are quoting plates at 2.85c. to 3c. An Eastern plate mill is asking 2.90c. to 3c. Hoop is firm at 3.30c. to 3.50c. A new inquiry came from the Standard Oil Co. for 20 stills requiring 700 tons of plates. The lull in the building field continues. Bids will be received May 28 for the Cleveland Public Library, requiring 4000 tons of structural steel.

Coke.—The demand for foundry coke is lighter than for some time. Prices show little change. Standard Connellsville foundry coke is quoted from $7 to $8.

Old Material.—The market is weak and prices have further declined. Heavy melting steel is 25c. a ton lower and some grades have been marked down as much as $1 a ton. Scrap production is large and this is being offered freely by industrial plants. The Ford Motor Co. is credited with the sale of 30,000 tons of scrap during the past few days, 10,000 tons of borings and 20,000 tons of turnings, compressed steel and other grades. Activity is very limited, as mills generally are keeping out of the market and there is little trading between dealers as few dealers have short orders.

We quote per gross ton f.o.b. Cleveland as follows:

Heavy melting steel	$23.00 to $23.25
Rails for rolling	25.50 to 26.00
Rails under 3 ft	25.00 to 25.50
Low phosphorus melting	26.00 to 26.25
Cast borings	18.25 to 18.50
Machine shop turnings	18.25 to 18.50
Mixed borings and short turnings	17.50 to 18.00
Compressed sheet steel	21.75 to 22.00
Railroad wrought	20.50 to 21.00
Railroad malleable	28.50 to 29.00
Light bundled sheet stampings	16.00 to 16.50
Steel axle turnings	20.00 to 20.50
No. 1 cast	28.00 to 29.00
No. 1 busheling	16.50 to 17.00
Drop forge flashings	20.00 to 20.50
Railroad grate bars	22.00 to 23.00
Stove plate	22.00 to 23.00
Pipes and flues	17.00 to 17.50

Cincinnati

Pig Iron Feelers for Third Quarter—Coke Sags—Scrap Lower

CINCINNATI, May 1.—The local market continues exceptionally dull as far as sales are concerned, but late in the week a few inquiries came out for third quarter iron. However, they are regarded more in the nature of feelers than an actual desire to buy. Included in the lot were 1000 tons of malleable iron, 800 tons of foundry iron for Dayton, 500 tons for Springfield, and several ranging from 100 to 300 tons. An eastern Ohio pipe company is in the market for 1000 tons for June and July delivery. While the Cincinnati market remained quiet, some southern Ohio iron was sold to Michigan points. A Detroit melter bought 600 tons for May shipment, and a northern Michigan melter 500 tons of malleable. A sale of a round tonnage of silvery was reported also. Southern iron was very quiet, only one sale being reported, 300 tons to a southern Indiana melter at $27, Birmingham, base. There is no demand for basic or Bessemer. Prices in the South continue very firm at $27 for all deliveries, but in the North a softer tone is evident, and on firm offers it is reported that $30, Ironton, basis, can be done for quick shipment. Some resale iron has been quoted at this price. While the demand is light, shipments continue good. A second Marting furnace was blown in last week.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$31.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	31.55
Ohio silvery, 8 per cent	41.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	$32.27 to 33.27
Basic Northern	32.27
Malleable	32.27 to 33.27

Sheets.—Naming of third quarter prices by the American Sheet & Tin Plate Co. caused some surprise, as it was felt that while advances would be made, they would hardly be so much above present levels. The company is reported to have its capacity booked well into the third quarter. Independent mills in this district will probably follow the lead of the corporation's subsidiary in respect to prices, and in fact one of them has already done so. Prices now generally ruling for both second and third quarter are 3c. for blue annealed, 3.85c. for black, 5c. for galvanized, and $5.50 per base box for tin plates. The demand for sheets continues strong, particularly for small lots for immediate shipment. Little third quarter business has yet been booked, though second quarter commitments will run well into this delivery.

Finished Materials.—With most of the consumers covered for second quarter requirements, the present demand is for fill-in tonnages from buyers who had underestimated their requirements, or who are bidding on rush work. While high premium prices are still in existence, the bulk of the orders are being booked at 2.40c. to 2.50c. for bars, and 2.50c. to 2.60c for shapes and plates. Plates in particular are in good demand, as tank builders are exceptionally busy, and more work is coming out than can be taken care of at the present time. On wire and wire products the demand continues strong, and while the situation in nails is reported to be easing up, there is a great scarcity of plain wire. Structural activity in the district is confined to small tonnages, principally for school buildings, of which there are a large number up for bids from this section. There are, however, a number of large projects in prospect, including a freight house at Indianapolis for the C. I. & L. Railroad, an 11-story hotel building at Ashland, Ky., stadium for Indiana University at Bloomington, Ind., and a power house at Purdue University, Lafayette, Ind. Architects have been selected for the $3,000,000 war memorial plaza at Indianapolis, and plans are now being prepared. The Columbia Club, Indianapolis, is also having plans prepared for a new club house, which will be 18 stories in height. The Twelfth St. Realty Co., Cincinnati, will take bids for a

6-story loft building, requiring 250 tons of reinforcing bars and a physicians' building at Fort Wayne, Ind., on which bids will be asked shortly, will require 300 tons. The Kemper-Thomas addition, Norwood, Ohio, on which bids were taken April 16, has been postponed indefinitely.

Warehouse Business.—Local jobbers report the best month since late 1920. Many orders running over 100 tons have been booked for bars, shapes and plates. Sheets are also in heavy demand. Nails are moving in heavy volume, and the supply is if anything a trifle easier. The demand for plain wire is far from satisfied, as jobbers report much difficulty in securing shipments sufficient to take care of the trade, and their stocks are very badly broken. Prices are strong, and it is expected an advance in sheet pices will be announced this week. Local jobbers have advanced prices of common wire nails from $3.40 to $3.60 per keg, base, and plain wire from $3.30 to $3.60.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.50c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.25c.; cold-rolled flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, 5c.; No. 28 galvanized sheets, 6c.; No. 9 annealed wire, $3.60 per 100 lb.; common wire nails, $3.60 per keg base.

Coke.—There is little activity in the coke market, although shipments on contracts are being anticipated in some quarters, while a few requests to hold up shipments have been received. Some fields are troubled by a shortage of cars, but on the whole the fuel movement is exceptionally good. Prices continue to sag. Connellsville foundry coke is down 50c. to $7.50 per net ton at ovens, while Wise County foundry coke has sold at $8. New River foundry and by product prices remain unchanged.

Old Material.—The scrap market continues inactive and prices are softer. Offerings by railroads are heavy, and this is given as a reason for the lower prices, combined of course with indisposition of mills to buy. A district steel plant, which recently paid $26, delivered, for heavy melting, is now offering $24. Machinery cast is in better demand for outside points, but little activity is noted for any grade in the Cincinnati district.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$16.50 to $17.00
Iron rails	19.00 to 19.50
Relaying rails, 50 lb. and up	29.50 to 30.00
Rails for rolling	21.00 to 21.50
Heavy melting steel	21.00 to 21.50
Steel rails for melting	19.00 to 19.50
Car wheels	20.50 to 21.00
Per Net Ton	
No. 1 railroad wrought	17.50 to 18.00
Cast borings	15.50 to 16.00
Steel turnings	14.50 to 15.00
Railroad cast	21.00 to 21.50
No. 1 machinery cast	24.50 to 25.00
Burnt scrap	16.50 to 17.00
Iron axles	27.50 to 28.00
Locomotive tires (smooth inside)	19.00 to 19.50
Pipes and flues	13.50 to 14.00

St. Louis

Heavy Melt for March—Pig Iron and Finished Material Dull

ST. LOUIS, May 1.—The report of the Federal Reserve Bank of St. Louis shows the melt in the district in March to have been the largest on record and approximately 6¼ per cent larger than February. That this situation continues is shown by the insistent demands for shipments against contracts. However, there is very little buying of pig iron and the market is quiet. Sales and inquiries are largely for spot iron in small quantities. So far but little interest is being shown in third quarter requirements. The market is unchanged on both Southern and Northern makes. An Indiana melter bought 1600 tons of malleable, at less than $32, Chicago, St. Louis sellers were informed.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$34.16
Northern malleable, sil. 1.75 to 2.25	34.16
Basic	34.16
Southen fdy., sil. 1.75 to 2.25	32.17

Finished Iron and Steel.—The inquiries for finished iron and steel have shown a marked falling off in number. Jobbers are not buying anything to speak of, and their inquiries have gone no further than to request information as to when third-quarter books would be opened by the mills. Railroad inquiries are only for odds and ends, and one road just emerging from receivership has issued a few cancellations. Fabricators report conditions are quiet.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, cold rolled, one pass, 5c.; cold drawn rounds, shafting and screw stock, 4.45c.; structural rivets, 4.15c.; boiler rivets, 4.25c.; tank rivets, ⅞ in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, square or hexagon blank, $2.50; and tapped, $2.50 off list.

Coke.—The coke market has eased up considerably. The supply of foundry grades is plentiful, with a heavy movement from Connellsville and Birmingham, and prices are off. The market for domestic coke is dull.

Old Material.—The market for old material continues weak, with prices of some grades showing further declines. Consumers are still out of the market, with no sign of their re-entering soon. What little buying there is is among the dealers themselves. The southwestern region of the Pennsylvania System has issued a list of 8000 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$21.00 to $21.50
Rails for rolling	22.50 to 23.00
Steel rails, less than 3 ft	23.00 to 23.50
Relaying rails, standard section	37.50 to 39.00
Cast iron car wheels	26.00 to 26.50
Heavy melting steel	20.00 to 20.50
Heavy shoveling steel	19.00 to 19.50
Frogs, switches and guards cut apart	21.50 to 22.00
Per Net Ton	
Heavy axles and tire turnings	16.00 to 16.50
Steel angle bars	20.00 to 20.50
Iron car axles	27.50 to 28.50
Steel car axles	24.00 to 24.50
Wrought iron bars and transoms	24.00 to 24.50
No. 1 railroad wrought	18.50 to 19.00
No. 2 railroad wrought	18.50 to 19.00
Railroad springs	24.00 to 24.50
Steel couplers and knuckles	24.00 to 24.50
Cast iron borings	14.50 to 15.00
No. 1 busheling	17.50 to 18.00
No. 1 railroad cast	22.00 to 22.50
No 1 machinery cast	22.00 to 22.50
Railroad malleable	22.00 to 22.50
Machine shop turnings	13.00 to 13.50

Boston

New York Furnaces Offer Iron at Less Than Buffalo Base

BOSTON, May 1.—The largest individual sale of pig iron reported is 500 tons of Buffalo special analysis, purchased to correct irregularity in foreign iron, at a price having no direct bearing on regularly quoted prices. Business otherwise was of extremely small proportions the past week. Two New York furnaces, having a decided advantage in freight rates over Buffalo, especially on Boston & Maine Railroad points, are soliciting business in this territory. One has quoted a delivered price, freight allowed, on a $28.50 Buffalo base. The other, with an advantage of about $1 in freight, has even bettered that price. Buffalo interests hold to $29.50, base, furnace. Virginia, $28.50, base, furnace, second quarter has been done in a small way in an effort to establish a backlog, as compared with $29 and $29.50, the general market. Unconfirmed reports have it $28, base, third quarter, has been done. Not enough eastern Pennsylvania and Alabama iron has been offered to really establish a market.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$35.15 to $36.65
East. Penn., sil. 1.75 to 2.25	34.65
Buffalo, sil. 2.25 to 2.75	34.91 to 35.41
Buffalo, sil. 1.75 to 2.25	34.41
Virginia, sil. 2.25 to 2.75	34.92 to 35.92
Virginia, sil. 1.75 to 2.25	34.42 to 35.42
Alabama, sil. 2.25 to 2.75	38.10
Alabama, sil. 1.75 to 2.25	37.60

Coke.—Further concessions in Connellsville coke quotations have failed to stimulate interest in such fuel in this territory, or influence in any way local by-product foundry coke prices. The going market on New England made fuel remains at $15 to $16 a ton delivered within the $3.10 freight zone. The Providence Gas Co. is maintaining shipping schedules, and the New England Coal and Coke Co. has materially increased deliveries, partly because of better transportation conditions and partly because of its increased foundry coke output.

Old Material.—The old material market has sagged further, more because of a lack of buyers than of any pressure to sell. Dealers continue to buy odds and ends against old contracts, but practically all such obligations have been completed. Pennsylvania mills continue to play a waiting game. Heavy melting steel is now generally quoted at $17.50 to $18, on cars. Business, however, has been placed at $17 and at $18.50. Buyers paying $17, now bid $16.50. Sales of yard wrought at $18.50 to $19, on cars, are fairly frequent. These, with moderate turnovers in No. 1 machinery cast, serve to keep interest among dealers alive. No. 2 machinery cast appears a drug on the market and there is almost no call for stove plate, which is offered more freely.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$27.00 to $27.50
No. 2 machinery cast	25.00 to 25.50
Stove plate	19.50 to 20.00
Railroad malleable	26.50 to 27.00
Street car wheels	25.50 to 26.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$17.50 to $18.00
No. 1 railroad wrought	20.50 to 21.00
No. 1 yard wrought	18.50 to 19.00
Wrought pipe (1 in. in diam., over 2 ft. long)	14.00 to 15.00
Machine shop turnings	14.50 to 15.00
Cast iron borings, rolling mill	15.00 to 15.50
Cast iron borings, chemical	18.50 to 19.00
Blast furnace borings and turnings	14.00 to 14.50
Forged scrap and bundled skeleton	14.00 to 14.50
Shafting	22.00 to 23.00
Street car axles	22.00 to 23.00
Rails for rerolling	19.50 to 20.00

Birmingham

Pig Iron Buying Extremely Light—Tennessee Company Bar Mill to Start

BIRMINGHAM, ALA., May 1.—Outside of purchases made by the leading pipe maker for the remainder of the second quarter and those of a harvester interest for same delivery, the two involving several thousand tons, no other real pig iron purchases were made in the Birmingham market last week unless the president of the leading pipe interest while here made further purchases not divulged. That pipe maker is loaded to the gunwales without cessation of new business. The base of $27 was charged universally. Some makers barely touched ink to order books. One maker booked 900 tons for a resuming industry that had just been rehabilitated. The rest were car loads and up to 200 tons for prompt delivery. Makers insist that the market is as strong as ever. Melters are likewise at ease and in no apparent hurry to further book for third quarter. The one query of a harvester interest for second half iron has not been repeated. The largest iron makers report no more business than the smallest. Transportation is better than in years. There is no accumulation of product anywhere. The Sloss-Sheffield Steel & Iron Co. expects to blow in a sixth stack by May 15. The Tennessee company has three stacks on foundry.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$27.00
Basic	26.00
Charcoal, warm blast	34.00

Cast Iron Pipe.—Pressure pipe is continuously active at base of $49. Memphis, which allotted 1100 tons to the United States Cast Iron Pipe & Foundry Co., is to receive bids on another large lot this week. Sanitary pipe is firm at $75 with a fair amount of new business.

Finishing Mills.—The steamer Langdon Hall is at Mobile loading with Tennessee company rails, etc., for the Orient. The new 10,000-ton merchant bar mill is expected to start presently. All steel mills continue at approximately 100 per cent. Cotton tie mills are producing a larger tonnage than usual. Steel bars are 2.70c., f.o.b. Birmingham. The Alabama Dry Docks Co. at Mobile is about to begin delivery of nine steel barges for use of the Tennessee company on the Warrior River. Johnson & Thompson, Birmingham, are fabricating the 1300 tons of steel for the barges.

Coal and Coke.—Coal production continues at the new maximum of more than 400,000 tons a week. Coke is very active at $9 average for spot foundry make, and $10 is sometimes charged. The leading coke interest is out of the market.

Old Material.—Scrap is moving with regularity in fair tonnages from yards to district consumers. Prices seem to have steadied like those of pig iron. Yards are laying in comfortable stocks, anticipating continuity of demand.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Old steel rails	$18.00 to $20.00
No. 1 steel	16.00 to 18.00
No. 1 cast	24.00 to 25.00
Car wheels	24.00 to 25.00
Tramcar wheels	23.00 to 24.00
Stove plate	18.00 to 19.00
Cast iron borings	12.00 to 13.00
Machine shop turnings	12.00 to 13.00

Rail Carriers in Alabama Reduce Car Rate on Pig Iron

BIRMINGHAM, ALA., May 1.—The rail carriers have, effective April 30, abolished the minimum charge of $15 per car on pig iron from furnaces to consumers in the Birmingham district and substituted a rate based on car capacity, which, the melters say, will make the average per car $10 instead of the present $15. It is claimed that the melters will save $10,000 a month by the new arrangement. The one abrogated was put in effect by the railroad administration in 1918.

Canadian Scrap Market

Toronto, May 1.—While the demand for some lines of iron and steel scraps continues active, dealers say that other lines have eased up during the past week or two. A shortage of such materials as heavy melting steel, steel turnings, heavy axle turnings, machinery cast and stove plate, continues to exist and very little material is being thrown on the market, contrary to dealers' expectations. In both Toronto and Montreal markets, steel plants are showing keen interest in their requirements of heavy melting steel and turnings and as a result dealers are having no difficulty in disposing of this class of material. Foundries are consistent buyers of machinery cast, stove plate and malleable scrap and during the past two or three weeks orders involving large tonnages have been closed by dealers. The difficulty in securing material is having an adverse effect on dealers' export business. Shipments of scrap to American buyers has been quiet of late, notwithstanding that inquiries from across the border have been fairly numerous. While no change has been made in dealers' buying prices during the past week those quoted are strong and some interests look for advances. Dealers' buying prices are as follows:

	Toronto Gross Tons	Montreal
Steel turnings	$14.00	$14.00
Machine shop turnings	14.00	13.00
Wrought pipe	14.00	12.00
Rails	17.00	15.00
No. 1 wrought scrap	18.00	15.00
Heavy melting steel	18.00	17.00
Steel axles	19.00	18.00
Axles, wrought iron	21.00	24.00
Net Tons		
Standard car wheels	18.00	17.00
Malleable scrap	18.00	17.00
Stove plate	19.00	18.00
No. 1 machinery cast	23.00	24.00

Philadelphia

Markets Continue Quiet — Pig Iron Dull — Scrap Declines Further

PHILADELPHIA, May 1.—The coke situation is the most engrossing feature of a dull market. The pig iron trade has watched with interest the decline in coke prices and the increase in the available supply with some misgivings as to the ultimate effect of this weakness upon pig iron prices. Connellsville furnace coke has been freely offered at $6 and less and furnace coke from other districts has been offered as low as $4.25, ovens. A good deal of so-called distress coke has appeared upon the market, some of which no doubt was intended for export. It appears that some of the export business contracted for a month or more ago has not been carried through and a partial embargo at the port of Philadelphia has also prevented some scheduled shipments. It depends on whether the decline in coke prices is a temporary condition or a definite settling to a new price basis as to its effect on pig iron. If coke should become freely available on contract around $5 a ton it would undoubtedly, in the opinion of furnace representatives, have a depressing influence on pig iron selling prices.

The steel market continues fairly strong, notwithstanding the falling off in current demand. The only indications of an easing of prices appear in a trimming down of some of the so-called premium quotations of Eastern mills. Plates are now available for shipment in two or three weeks at 2.60c., Pittsburgh, and structural shapes at 2.75c., Eastern mill, while bars are somewhat easier to get at 2.50c., Pittsburgh, for shipment in about three months.

Ore.—Pilling & Co., Philadelphia, has sold 50,000 tons of Wabana ore to an Eastern steel company.

Ferroalloys.—British producers of ferromanganese have notified their American agents to advance their selling price to $125 per ton, c.i.f. Atlantic seaboard, for September to December delivery, the earliest that is available. The leading domestic producer is disinclined to quote at all, but such quotations as it is making are on the same basis as the British alloy. Small lots of spiegeleisen are available at $55, seaboard, for prompt shipment. Fifty per cent ferrosilicon is held at $95, delivered, for prompt or second half.

Semi-Finished Steel.—There is very little demand for billets, but such quotations as have been made are at $45 to $47.50, Pittsburgh, for open hearth rerolling quality, and at $55, Pittsburgh, for forging quality.

Pig Iron.—There is a slightly increased demand for foundry iron for delivery in May and June, as compared with the past two weeks, but buyers are not interested in third quarter iron. Consumption is going ahead at a fairly heavy rate and the trade believes that there will be more buying soon, as a good many consumers are only partially covered for the remainder of this quarter. Prices, as quoted by furnaces, are unchanged at $31 for No. 2 plain, $32 for No. 2X, $33 for No. 1X, $28.50 to $29 for gray forge, $30 for basic and $32 for malleable, all f.o.b. furnace, but there have been concessions from these prices on relatively small lots of resale iron in the hands of merchants. Such concessions usually have not exceeded 50c. per ton. Sales totaling 5000 tons or more of standard low phosphorus iron have been made to two large Eastern consumers at $32, furnace, a reduction of $3 a ton from the nominal quotation of $35, which has been in effect for some time. Copper bearing low phosphorus iron is being held at $33, furnace, by the two leading Eastern producers. An Eastern merchant has sold 1000 tons of foreign low phosphorus iron for shipment to California. Virginia foundry iron is available at $28.50 to $29, base, for May and June, and at $29 for third quarter. The usual $1 differentials on higher silicon grades of Virginia iron have not held in all instances. The Goshen furnace goes in blast this week, making six active furnaces in Virginia. Pig iron imports for the week ended April 21 totaled 3750 tons, of which 2250 came from England, 1000 tons from British India and 500 from Germany. In the week ended April 28 only 1200 tons arrived, all from England.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$31.76 to $32.64
East. Pa. No. 2X, 2.25 to 2.75 sil.	32.76 to 33.64
East. Pa. No. 1X	33.76 to 34.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	33.67 to 34.17
Virginia No. 2X, 2.25 to 2.75 sil.	34.67 to 35.17
Basic delivered eastern Pa.	31.00 to 31.50
Gray forge	29.50 to 30.00
Malleable	33.14 to 33.64
Standard low phos. (f.o.b. furnace), nominal	32.00 to 35.00
Copper bearing low phos. (f.o.b. furnace)	33.00

Foreign Pig Iron

All prices f.o.b. cars Philadelphia, duty paid.

Continental foundry, 1.80 to 2.50 sil.	$31.00
Continental foundry, 2.50 to 3 sil.	32.00
Low phos. copper free, guar. not over 0.035 per cent phos.	35.00 to 36.00
Continental, phos. 1.50; sil. 2 to 3	31.50

Plates.—An Eastern mill is now offering plates freely for shipment within a few weeks at 2.60c., Pittsburgh. This is having the effect of making it less easy for those mills which have been quoting 2.75c., Pittsburgh, to obtain that figure. The demand for plates has shrunk considerably in the last few weeks, but most of the mills have from one to three months' business. A good deal of the demand continues to come from the Central West. We quote plates for shipment from Eastern mills at 2.60c. to 2.75c., Pittsburgh.

Structural Shapes.—Eastern structural mills are booking a smaller volume of business than they were a month or so ago and hence are finding their position as to deliveries slightly easier. In a few instances the peak price of 2.85c., Eastern mill, has given way to 2.75c., mill. Orders continue to come from Central Western buyers notwithstanding the fact that the freight rate is against them. One sale of 400 tons at 2.75c., mill, was made for shipment to Michigan. Very little new structural work is being figured on in this district.

Bars.—Steel bars are slightly easier to get at 2.50c., Pittsburgh. The 2.40c. price named by two large interests is not yet given much significance because these mills are booking very little tonnage except for indefinite delivery. Bar iron is held at 2.50c., Pittsburgh, by practically all producers in the East.

Sheets.—The prices asked by independents for sheets are from $3 to $5 a ton above the third quarter prices named by the American Sheet & Tin Plate Co., and it remains to be seen whether any of the independents will meet the corporation on third quarter contracts. For such delivery as the mills can give blue annealed is quoted at 3.25c., black at about 4c. and galvanized at 5.25c. or higher, Pittsburgh.

Warehouse Business.—Prices for steel out of stock are unchanged and for local delivery are as follows:

Soft steel bars and small shapes, 3.55c.; iron bars (except bands), 3.55c.; round edge iron, 3.75c.; round edge steel, iron finished, 1½ x ½ in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates, ¼ in. and heavier, 3.65c.; tank steel plates, ⅜ in., 3.95c.; blue annealed steel sheets, No. 10 gage, 4.25c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.65c.; structural shapes, 3.65c.; diamond pattern plates, ¼-in., 5.40c.; ⅜-in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.75c.; narrower than 1 in., all gages, 5.25c.; steel bands, No. 12 gage to ⅛-in., inclusive, 4.35c.; rails, 3.55c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—Further declines in prices of old material have occurred within the week. Sales of No. 1 heavy melting steel have been made at $22 and there were indications today that consumers might be able to cover at $21.50, delivered. One large dealer was offering only $20.50 for steel delivered at a large Eastern plant. Several grades of foundry scrap are off $1 or more a ton. The only advance is on blast furnace borings and turnings, which have gone up on increased buying for Sparrows Point furnaces, where $19.50, delivered, has been paid. Neither consumers nor dealers are showing much interest in the market,

the activities of dealers and brokers being confined mostly to covering on old orders. Mills complain of the poor quality of steel scrap which is being shipped to them and there have been a great many rejections.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	22.00 to 23.00
Scrap rails	22.00 to 23.00
Steel rails for rolling	24.00 to 25.00
No. 1 low phos., heavy 0.04 and under	29.00 to 30.00
Cast iron car wheels	25.00 to 26.00
No. 1 railroad wrought	25.00 to 26.00
No. 1 yard wrought	24.00 to 25.00
No. 1 forge fire	19.50 to 20.50
Bundled sheets (for steel works)	19.00 to 19.50
No. 1 busheling	22.00 to 23.00
Mixed borings and turnings for blast furnace use	19.50 to 20.00
Machine shop turnings (for steel works use)	19.00 to 20.00
Machine shop turnings (for rolling mill use)	20.00 to 20.50
Heavy axle turnings (or equivalent)	20.00 to 21.00
Cast borings (for steel works and rolling mills)	19.00 to 20.00
Cast borings (for chemical plants)	24.00 to 26.00
No. 1 cast	25.00 to 27.00
Heavy breakable cast (for steel plants)	22.00 to 23.00
Railroad grate bars	20.00 to 21.00
Stove plate (for steel plant use)	20.00 to 21.00
Railroad malleable	22.00 to 24.00
Wrought iron and soft steel pipes and tubes (new specifications)	19.50 to 20.50
Shafting	26.00 to 28.00
Steel axles	26.00 to 28.00

To Build Strip Steel Mill in Detroit

DETROIT, May 1.—The Detroit Steel Corporation, Detroit, a new company organized several months ago, with a capitalization of $500,000, for the purpose of manufacturing strip steel for use in the automobile, typewriting, hardware, adding machine and similar industries, will begin the erection of its new plant in about ten days. The location is on Fort Boulevard, one-half mile west of the new Fort Street bridge, on the main line of the Michigan Central Railroad.

The corporation is the outgrowth of the heavy and constant demand for strip steel in this district and was organized by W. C. Schrage, who is president of the new company and also secretary-treasurer of the Craine-Schrage Steel Co. The three units of the plant will be erected of structural steel and sheet iron. One building will be 80 x 150 ft., another 80 x 250 ft., and the third unit 50 x 150 ft. At the beginning 200 men, it is estimated, will be employed. The first unit will comprise the storeroom and pickling plant, the other the cold roll mill and the third the annealing furnaces and shipping room. Adjacent to the mill will be located a powerhouse, office building and storage tanks for oil, which will supply the furnaces. The company has acquired a 12-acre tract of land, which will permit future expansion.

Contracts for the electrical equipment, including the motors, have been let to the General Electric Co.; for machinery to the E. W. Bliss Co., Brooklyn, and for furnaces, Swindell Brothers, Pittsburgh.

The officers and directors of the Detroit Steel Corporation are: W. C. Schrage, president; Oscar Olson, formerly of the Columbia Steel Co., Elyria, Ohio, vice-president and works manager; Arthur Schrage, vice-president Craine-Schrage Steel Co., secretary; Anthony Bodde, treasurer. Directors include the officers and Clyde P. Craine, president Craine-Schrage Steel Co., Leo Rosier and Joseph C. Friedel, cashier of the Hamtramck State Bank. The Craine-Schrage Steel Co. will be the sales agency for the new company with its estimated production of 1500 tons of finished steel monthly.

The Marquette Iron Co., which is the holding company controlling the Mary Charlotte Mining Co., the Marquette Ore Co., the Washington Iron Co. and the Breitung Iron Co., four iron mining companies, has passed into the hands of new interests and has been reorganized. The following executive committee is now in control of the company: Joseph W. Powell, Boston, formerly with Bethlehem Shipbuilding Co., Ltd.; Frederick W. Wood, Baltimore, formerly president of the Maryland Steel Co., and Charles E. Spencer, Jr., vice-president First National Bank, Boston.

NO REAL SLACKENING

President Grace on Business Conditions—Mexicans Working Well

President Eugene G. Grace of the Bethlehem Steel Corporation in his statement at the directors' meeting held April 26, when the regular dividend of 1¼ per cent on common stock was declared, said that earnings in the quarter fell short of dividend requirements over the entire period. However, there had been marked improvement throughout, he said, and earnings for March more than covered both preferred and common dividend requirements for that month.

Mr. Grace pointed out that the smaller showing for January and February was due to the fact that the corporation had been working on orders contracted for at lower prices than those shipped in March.

Discussing general conditions, Mr. Grace said there had been no real slackening in the demand for steel products, although there had been a few instances where buying had been smaller than in recent months. This was because the mills had so much business on their books that the buyers would have had to wait a long time for delivery.

Prices are holding firm, according to Mr. Grace, and he expects them to continue so for some time. The increase in wages, effective April 16, he said, was estimated to add $2 a ton to the cost of finished steel products, but it was believed the increase in billing prices resulting from the completing of old low price contracts would at least be equal to this added cost. The volume of orders booked and being booked requires capacity operations of the steel properties, with every indication that this condition will continue with firm but not runaway prices obtaining.

Regarding the outlook for labor, Mr. Grace said he saw no trouble ahead. The situation has improved as a result of the recent wage increase and the industry has passed the period when men leave the mills for outdoor work. In answer to questions, he said that Bethlehem is employing about 1000 Mexicans in the mills. These men, he said, were doing satisfactory work; in fact, better than expected. They are receiving the same wages as are the Americans. Most of them are in the unskilled labor class, he said, but some have done so well that they have been advanced.

Detroit Scrap Market

DETROIT, May 1.—There has been some indication of slight decline in prices on all waste material, most grades registering a decline of $1 to $1.50 per ton. Dealers predominate in the buying for approximately 2800 tons of turnings borings, flashings, regular hydraulic compressed, shoveling and heavy melting steel offered by one of the largest producers in this district for May delivery.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel	$21.50 to $22.50
Shoveling steel	23.50 to 24.50
No. 1 machinery cast	26.00 to 27.50
Cast borings	16.75 to 17.75
Automobile cast scrap	27.50 to 29.00
Stove plate	19.50 to 21.00
Hydraulic compressed	19.75 to 20.75
Turnings	16.00 to 17.00
Flashings	17.25 to 18.25

The Jones & Laughlin Steel Corporation recently launched the first of 21 steel barges it is building at its own yards in Pittsburgh for its river delivery service. The barge launched and most of those under construction are open-top type, 132 ft. long, 35 ft. wide and 10 ft. deep, with a capacity of 850 tons, and fitted with watertight compartments and collision bulkheads. Most of the barges engaged in river service are 200 ft. long and the idea back of the construction of a shorter boat is to permit its use in some of the streams tributary to the Ohio and Mississippi rivers which longer barges cannot negotiate.

British Iron and Steel Market

Export Ferromanganese Up to £20—Pig Iron Prices Lower—Coke Higher—Steel Prices Weakening

(By Cable)

LONDON, ENGLAND, May 1.

Pig iron is easier on decreased sales for home and export customers. Makers generally are well sold, but some are accepting lower figures and business is being done in Cleveland at 2½s. (58c.) reduction. Consumers are somewhat nervous over Ruhr developments, as the Continent is competing again.

Hematite is dull, with quotations 2½s. easier. Foreign ore is quiet. Best Bilbao Rubio is quoted at 24¼s. ($5.62), ex-ship Tees.

Continental demand for finished iron and steel has dwindled considerably and other export buyers are not showing much interest.

The lockout of boilermakers is affecting the output of Clyde shipbuilding. Production in April amounted to 11 vessels launched, of 51,700 tons gross register.

There are unconfirmed reports of negotiations in the direction of an amalgamation between Baldwins, Ltd., and Guest, Keen & Nettlefolds, Ltd., Birmingham.

Continental position is improving, owing to increased supplies of fuel, and Belgian plants now are offering all kinds of material at competitive prices, but buyers are not keen and little business is being done.

In France, Redange-Dilling has blown in one furnace at Redange. The Société Lorraine des Acieres de Rombas is relighting one furnace. De Wendel et Cie. has blown in furnaces at Joeuf, Moyeuvre and Hayange.

In Germany, Rothe Erde has blown out all furnaces at Aix-la-Chapelle (Aachen).

In Poland, several furnaces have been relighted recently and others are to be re-started shortly. The total now blowing is six.

Tin plate is slightly firmer on some consumers buying up to a 24½s. ($5.68) basis, IC, f.o.b., done for June and July shipment. Makers generally are asking 25s. ($5.80) basis and upward, but some are inclined to accept less. Export buying is quiet, there having been moderate sales to South America and France. In the domestic trade, consumers have bought odd sizes on the 24½s. basis, IC, f.o.t.

There is a slightly improved demand for galvanized sheets, sales having been made to India and South America.

Far Eastern specifications for black sheets are in request, but the works are sold out until September and little business is moving. India and the Continent have been small buyers.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.64 per £1, as follows:

Durham coke, delivered	£2	3s.				$9.98		
Cleveland No. 1 foundry	6	10				30.16		
Cleveland No. 3 foundry	6	5				29.00		
Cleveland No. 4 foundry	6	0				27.84		
Cleveland No. 4 forge	5	17½				27.26		
Cleveland basic	6	0				27.84		
East Coast mixed	6	2½				28.42		
Ferromanganese	18	0				83.52		
Ferromanganese*	20	0				92.80		
Rails, 60 lb. and up	10	0	to	£10	10	46.40	to	$48.72
Billets	9	10	to	10	0	44.08	to	46.40
Sheet and tin plate bars, Welsh	10	0				46.40		
Tin plates, base box	1	4¼	to	1	5	5.62	to	5.80
						C. per Lb.		
Ship plates	10	5	to	10	15	2.12	to	2.23
Boiler plates	12	10	to	13	0	2.59	to	2.69
Tees	11	0	to	11	10	2.28	to	2.38
Channels	10	5	to	10	15	2.12	to	2.23
Beams	9	15	to	10	5	2.02	to	2.12
Round bars, ¾ to 3 in.	11	0	to	11	10	2.28	to	2.38
Galvanized sheets, 24 g.	19	10	to	20	0	4.04	to	4.14
Black sheets, 24 gage	14	10	to	14	15	3.00	to	3.06
Black sheets, Japanese specifications	15	5				3.16		
Steel hoops	11	0	&	13	0*	2.28	&	2.69*
Cold rolled steel strip, 20 g.	23	0				4.76		
Cotton ties, Indian specifications	15	0				3.11		

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

Billets:								
Belgium, May, June	£7	0s.	to	£8	0s.	$32.48	to	$37.12
Merchant bars:						C. per Lb.		
Belgium, May, June	8	12½	to	8	15	1.79	to	1.81
Luxemb'g, May, June	8	15	to	8	17½	1.81	to	1.89
Joists (beams):								
Belgium, May, June	8	12½	to	8	15	1.79	to	1.81
¼-In. plates:								
Belgium, May, June	9	10				1.97		

Continental Competition Again in Evidence—Prices Too High for Most Buyers and Long Commitments Are Avoided

LONDON, ENGLAND, April 19.—There has been a considerable lull in the business in both pig iron and in manufactured iron and steel within the last week or ten days. Of course, after the heavy buying of the past week some setback was expected, but the position is now becoming uncertain, owing to the developments on the Continent. Prices here have undoubtedly reached extravagant levels, but with works generally well sold, there is little necessity to put values down. But there is no doubt that buyers in certain quarters, particularly the Indian markets, are not at all inclined to follow the rise. In fact, a feature has been the poor demand from India for any kind of material.

Within the last few days about eight Continental manufacturers have come into the market again, which goes to show that the position on that side must, to a certain degree, be improving. Most of the works concerned are Belgian, but one large Luxemburg concern and two French plants are also included. The fact that prompt deliveries can be given shows that the business is wanted, but at the same time the prices asked are, on an average, about 20s. to 25s. ($4.65 to 5.81) per ton more than they were before the dislocation, and at these new figures practically no business is forthcoming. Nevertheless confidence on this side is becoming slightly shaken, and even home consumers are beginning to feel that they will do well to wait.

In the meantime pig iron values remain unchanged, as the works are heavily sold for two to three months ahead, and spot supplies of any grade are unobtainable, while there is little disposition, either among buyers or sellers, to enter into negotiations for deliveries after the end of the half-year. Output all over the country is being increased in a small degree, but any general expansion is out of the question while the costs of raw materials remain at their present exorbitant levels. No. 3 G. M. B. iron is quoted at £6 7½s. ($29.64) and East Coast mixed numbers are about £6 5s. ($29.06) to £6 10s. ($30.23), according to grade.

As mentioned above, business in the finished iron and steel departments has been considerably quieter. With the exception, however, of tin plates, in which values have reacted slightly on resales, there is as yet no sign of any material weakening in price. Works are comfortably placed for orders, but if the lull continues for long the time is bound to come when order books will need replenishing. The colonial markets in general are very slow to place orders. India in particular being the worst offender, while it is reported that dealers in material for Australian markets are beginning to suffer from Australian competition, now that the Broken Hill steel works have reopened.

On the other hand the strong demand from the Continent, or rather from Germany, has continued persistent, and some good orders for shipbuilding material have been secured, even at the high prices asked. There is, however, of course a certain amount of risk in such business, as when it comes to specifying, the orders may not be forthcoming. In the home trade not a great deal has been moving, buyers being shy of prices and contenting themselves with purchasing only to cover immediate requirements.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots—For additional prices, see page 1287

Plates

Sheared, tank quality, base, per lb.....2.50c. to 2.75c.

Structural Material

Beams, channels, etc., base, per lb.....2.50c. to 2.60c.
Sheet piling .....2.65c. to 2.75c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.40c. to 2.75c.
Refined iron bars, base, per lb.....3.25c.
Double refined iron bars, base per lb.....4.85c. to 5.00c.
Stay bolt iron bars, base, per lb.....8.00c. to 8.50c.

Hot-Rolled Flats

Hoops, ordinary gages and widths, base, per lb.3.30c. to 3.50c.
Hoops, light gage, under 1 in. wide.....3.75c.
Bands, base, per lb.....3.30c. to 3.50c.
Strips, base, per lb.....3.30c. to 3.50c.
Cotton ties, per bundle of 45 lb.....1.60c.

Cold-Finished Steels

Bars and shafting, base, per lb.....3.25c.
Strips, base, per lb.....5.25c. to 5.50c.

Wire Products

Nails, base, per keg.....$3.00
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in.....$2.50 over base
Bright plain wire, base, No. 9 gage per 100 lb..... 2.75
Annealed fence wire, base, per 100 lb..... 2.90
Spring wire, base, per 100 lb..... 3.70
Galvanized wire, No. 9, base, per 100 lb..... 3.35
Galvanized barbed, base, per 100 lb..... 3.80
Galvanized staples, base, per keg..... 3.80
Painted barbed wire, base, per 100 lb..... 3.45
Polished staples, base, per keg..... 3.45
Cement coated nails, base, per count keg..... 2.70
Woven fence, carloads (to jobbers) 67½ to 66½ per cent off list
Woven fence, carloads (to retailers)..65 to 64 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads.....50 per cent off list
Machine bolts, small, cut threads....40 and 10 per cent off list
Machine bolts, larger and longer....40 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
  Smaller and shorter, rolled threads....45 per cent off list
  Cut threads .....40 per cent off list
  Longer and larger sizes .....40 per cent off list
Lag bolts .....50 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads...40 and 10 per cent off list
  Other style heads .....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
  Smaller and shorter .....35 and 5 per cent off list
  Larger and longer sizes.....35 and 5 per cent off list
Hot pressed square or hex. nuts, blank.....$3.00 off list
Hot pressed nuts, tapped ..... 2.75 off list
C.p.c. and t. square or hex. nuts, blank..... 3.00 off list
C.p.c. and t. square or hex. nuts, tapped..... 2.75 off list
Semi-finished hex. nuts:
  ⅞ in. and smaller, U. S. S.....75 and 5 per cent off list
  ⅞ in. and larger, U. S. S.....70 and 2½ per cent off list
  Small sizes, S. A. E.....75, 10 and 5 per cent off list
  S. A. E., ⅝ in. and larger....75, 10 and 2½ per cent off list
Stove bolts in packages.....75, 10 and 5 per cent off list
Stove bolts in bulk.....75, 10, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws, 70 and 10 per cent off list
Milled set screws.....70 and 10 per cent off list
Upset cap screws.....75 per cent off list
Upset set screws.....75 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb. .....$3.25 to $3.50
Large boiler rivets, base, per 100 lb..... 3.35 to 3.60
Small rivets .....60 and 10 to 60 and 5 off list

Track Equipment

Spikes, ⅝ in. and larger, base, per 100 lb..... $3.15
Spikes, ½ in. ⅞ in. and ⅝ in., per 100 lb..... 3.75
Spikes, ⅜ in. 3.75
Spikes, boat and barge, base, per 100 lb.....$3.50 to 3.75
Track bolts, ¾ in. and larger, base, per 100 lb. 4.25 to 4.50
Track bolts, ½ in. and ⅝ in., base, per 100 lb. 5.50
Tie plates, per 100 lb..... 2.55 to 2.60
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
¼	45	19½	¼ to ⅜	+11	+39
¼ to ⅜.....	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3.....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6.....	59	47½	2½	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10....	54	41½	7 to 12.....	26	11
11 and 12....	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜.....+19		+54
¼ to ⅜.....	47	30½	½	21	7
½	53	42½	¾	28	12
¾	58	47½	1 to 1½....	30	14
1 to 1½.....	60	49½			
2 to 3.....	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 and 8.....	52	39½	7 to 8.....	21	7
9 and 10....	45	32½	9 to 12.....	16	2
11 and 12....	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent, on galvanized.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.....	27	1½ in. .....+18	
2½ to 2¾ in.....	37	1⅝ to 1⅞ in. .....+ 8	
3 in	40	2 to 2¼ in. .....— 2	
3¼ to 3¾ in.....	42½	2½ to 3 in. .....— 7	
4 to 13 in.....	46	3¼ to 4½ in. .....— 9	

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	55	2½ and 2¾ in.....	32
1¼ and 1½ in.	47	3 and 3¼ in.....	39
1⅝ in.	31	3½ and 3¾ in.....	37
2 and 2¼ in.....	22	4 in.....	41
		4½ in. and 5 in.....	33
Hot Rolled			
3 and 3¼ in.....	38	3½ in. and 3¾ in....	39
		4 in.....	43

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....83 per cent off list
Carbon 0.30 to 0.40, base.....81 per cent off list
Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage.....	15	2¼-in. O.D. 10 gage...	20
2-in. O.D. 11 gage.....	16	3-in. O.D. 7 gage.....	35
2-in. O.D. 10 gage.....	17	1½-in. O.D. 9 gage....	15
2¼-in. O.D. 12 gage...	17	2⅝-in. O.D. 9 gage....	55
2¼-in. O.D. 11 gage...	18	5½-in. O.D. 9 gage....	57

Tin Plate

Standard cokes, per base box.....$5.50 to $6.00

Terne Plate

(Per package, 20 x 28 in.)

8-lb. coating, per 100 lb. base $11.00		20-lb. coating I. C....	14.90
		25-lb. coating I. C....	16.20
8-lb. coating I. C.....	11.30	30-lb. coating I. C....	17.35
12-lb. coating I. C....	12.70	35-lb. coating I. C....	18.35
15-lb. coating I. C....	13.95	40-lb. coating I. C....	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....3.00c. to 3.35c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.85c. to 4.25c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb. 5.35c. to 5.60c.

Galvanized

No. 28 (base), per lb.....5.00c. to 5.50c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.85c. to 4.25c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.32	Buffalo	$0.26	St. Louis	$0.43
Philadelphia, export...	0.235	Cleveland	0.21	Kansas City	0.735
Baltimore, domestic...	0.31	Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)...	0.705
Baltimore, export.....	0.225	Detroit	0.29	St. Paul	0.60
New York, domestic...	0.34	Cincinnati	0.29	Omaha	0.735
New York, export....	0.255	Indianapolis	0.31	Omaha (pipe)	0.705
Boston, domestic.....	0.365	Chicago	0.34	Denver	1.27
Boston, export.....	**0.255**			Denver (pipe)	1.215

Pacific Coast	$1.50		
Pac. Coast, ship plates	1.20		
Birmingham	0.69		
Memphis	0.385		
Jacksonville, all rail..	0.50		
Jacksonville, rail and water	0.415		
New Orleans	0.515		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products including cut or wire nails, spikes, and wire hoops, 30c. to 40c.; sheets and tin plates, 30c. to 40c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 49c.; pipes not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Old range non-Bessemer, 51½ per cent iron	5.70
Messabi Bessemer, 55 per cent iron	6.20
Messabi non-Bessemer, 51½ per cent iron	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	12c.
Iron ore, Swedish, average 66 per cent iron	9.5c. to 10c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus	45½c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	43½c.
Manganese ore, Brazilian or Indian	45c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.50
Chrome ore, basic, 48 per cent Cr_2O_3, crude per ton, c.i.f. Atlantic seaboard	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$122.50 to $130.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid	125.00
Spiegeleisen, foreign, 19 to 21 per cent, seaboard, per ton	45.00 to 55.00
Spiegeleisen, domestic, 16 to 19 per cent, furnace, per ton, nominal	39.00
Ferrosilicon, 50 per cent, delivered per gross ton	95.00
Ferrosilicon, Bessemer, 10 per cent, per ton, furnace	48.50
Ferrosilicon, Bessemer, 11 per cent, per ton, furnace	51.80
Ferrosilicon, Bessemer, 12 per cent, per ton, furnace	55.10
Ferrosilicon, Bessemer, 13 per cent, per ton, furnace	59.10
Ferrosilicon, Bessemer, 14 per cent, per ton, furnace	64.10
Silvery iron, 6 per cent, per ton, furnace	37.00
Silvery, iron, 7 per cent, per ton, furnace	38.00
Silvery iron, 8 per cent, per ton, furnace	39.50
Silvery iron, 9 per cent, per ton, furnace	41.50
Silvery iron, 10 per cent, per ton, furnace	43.50
Silvery iron, 11 per cent, per ton, furnace	46.80
Silvery iron, 12 per cent, per ton, furnace	50.10
Ferrotungsten, per lb. contained metal	88c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	12c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr. per lb.	11.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica per net ton f.o.b. Illinois and Kentucky mines	$20.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica per net ton, f.o.b. Illinois and Kentucky mines	21.50

Per 1000 f.o.b. works:

	High Duty	Moderate Duty
Fire Clay:		
Pennsylvania	$48.00 to $51.00	$43.00 to $46.00
Ohio	45.00 to 47.00	40.00 to 43.00
Kentucky	45.00 to 47.00	42.00 to 45.00
Illinois	48.00 to 50.00	45.00 to 47.00
Missouri	48.00 to 50.00	38.00 to 43.00
Ground fire clay, per net ton		6.50 to 9.50
Silica Brick:		
Pennsylvania		47.00
Chicago		52.00
Birmingham		48.00
Ground silica clay, per net ton		10.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		50.00

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$45.00 to $46.00
Rolling billets, 2-in. and under	45.00 to 46.00
Forging billets, ordinary carbons	55.00 to 58.00
Sheet bars, Bessemer	45.00 to 46.00
Sheet bars, open-hearth	45.00 to 46.00
Slabs	45.00 to 46.00
Wire rods, common soft, base, No. 5 to ¼-in.	51.00 to 55.00
Wire rods, common soft, coarser than ¼-in.	$2.50 over base
Wire rods, screw stock	$5 per ton over base
Wire rods, carbon 0.20 to 0.40	$3 per ton over base
Wire rods, carbon 0.41 to 0.55	$5 per ton over base
Wire rods, carbon 0.56 to 0.75	$7.50 per ton over base
Wire rods, carbon over 0.75	$10 per ton over base
Wire rods, acid	$15 per ton over base
Skelp, grooved, per lb.	2.50c. to 2.80c.
Skelp, sheared, per lb.	2.50c. to 2.80c.
Skelp, universal, per lb.	2.50c. to 2.80c.

Finished Iron and Steel, f.o.b. Mill

Rails, heavy, per gross ton	$43.00
Rails, light, new steel, base, per lb.	2.25c.
Rails, light, rerolled, base, per lb.	2.25c.
Spikes, $\frac{5}{16}$-in. and larger, base, per 100 lb.	$3.15 to $3.25
Spikes, ½-in., $\frac{7}{16}$-in. and $\frac{5}{8}$-in., base, per 100 lb.	3.25 to 3.75
Spikes, $\frac{7}{16}$-in., base, per 100 lb.	3.25 to 3.75
Spikes, boat and barge, base, per 100 lb.	3.50 to 3.75
Track bolts, $\frac{5}{8}$-in. and smaller, base, per 100 lb.	4.25 to 5.50
Track bolts, ¾-in. and larger, base, per 100 lb.	4.25 to 4.50
Tie plates, per 100 lb.	2.55 to 2.60
Angle bars, per 100 lb.	2.75
Bars, common iron, base, per lb.	2.50c. to 2.60c.
Bars, rail, steel reinforcing, base, per lb.	2.15c. to 2.25c.
Ground shafting, base, per lb.	3.65c.
Cut nails, base, per keg	$3.40

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100 (½% Nickel, 10 to 20 per cent Carbon)	$3.75
2300 (3½% Nickel)	5.75
2500 (5% Nickel)	8.25
3100 (Nickel Chromium)	4.75
3200 (Nickel Chromium)	6.50
3300 (Nickel Chromium)	8.75
3400 (Nickel Chromium)	7.75
5100 (Chromium Steel)	4.25
5200 (Chromium Steel)	8.50
6100 (Chromium Vanadium bars)	$5.25 to 5.50
6100 (Chromium Vanadium spring steel)	5.00 to 5.25
9250 (Silico Manganese spring steel)	4.25
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.75
Chromium Molybdenum bars (0.70-1 Chromium, 0.25—0.40 Molybdenum)	5.25 to 5.50
Chromium Molybdenum spring steel (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	5.00 to 5.25

Above prices are for hot-rolled alloy steel bars, forging quality, per 100-lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of $10 per gross ton; on billets smaller than 2½-in. sq. the net ton bar price applies.

To Investigate Apprentice Systems

A nationwide investigation of the apprentice system will be made by a committee named by the plant executives division of the American Management Association. L. L. Park, welfare director, American Locomotive Co., Schenectady, N. Y., heads the new committee.

Modernizing American apprentice systems is one of the aims of the committee, the findings of which will be embodied in a report to be presented at the fall convention of the Association. It is the plan of the committee to touch upon such phases of the subject as will aid in the promotion of apprentice schools and of training courses in various lines of industry along the most approved and successful lines.

The members of the committee include: P. E. Wakefield, educational director Carnegie Steel Co., Pittsburgh; E. W. Gressle, employment manager, Warner & Swazey Co., Cleveland; A. C. Lampman, supervisor of apprentices National Cash Register Co., Dayton, Ohio; I. B. Shoup, manager of personnel and training, Marion Steam Shovel Co., Marion, Ohio; Franklin T. Jones, educational director, White Motor Co., Cleveland; J. P. Garvey, director of training, Western Electric Co., Chicago; W. S. Berry, director of training, Scovill Mfg. Co., Waterbury, Conn., and Frank Cushman, Federal Board for Vocational Education, Washington.

PERSONAL

E. E. Goodwillie, sales agent for the Bethlehem Steel Co., having charge of the Chicago district, now has charge of that district for the combined Bethlehem and Midvale interests. He was graduated from Cornell University in 1910, going immediately to the works of the Pennsylvania Steel Co. at Steelton, Pa., where he spent a year and a half in the mills in preparation for sales work. He represented the Pennsylvania Steel Co. in Pittsburgh from 1913 to July, 1916, when the Bethlehem Steel Co. took over the Pennsylvania company. He then went with the Bethlehem company and was connected with its Pittsburgh sales office until March, 1921, when he was appointed district sales agent in charge of the Cleveland district. His appointment as sales agent in Chicago dates from last October.

E. E. GOODWILLIE

John M. Robb, Jr., who has represented Park & Williams, Inc., Real Estate Trust Building, Philadelphia, in selling Swede pig iron in Philadelphia and New York territories, will hereafter cover the New England territory, the agency for Swede iron in that district having been placed in the hands of Park & Williams, Inc., effective May 1.

John C. Neale, formerly vice-president and general sales manager of the Midvale Steel & Ordnance Co., has become affiliated with the American Stainless Steel Co., Pittsburgh, as president and general manager. Mr. Neale, before joining the Midvale company, had been with the Central Steel Co., Massillon, Ohio, construction of the plant of which he supervised, and before that with the Carnegie Steel Co. in Pittsburgh. The American Stainless Steel Co., offices of which are at 801 Commonwealth Building, Pittsburgh, has the American rights to a number of English patents on noncorrosive ferrous metals and holds the Brearley and Haynes patents. It is not a manufacturing company but licenses others to manufacture under these patents.

Frank B. Baird, formerly president of the Buffalo Union Furnace Co., Buffalo, is traveling in the Orient.

Walter S. Reed, who for a number of years has been vice-president and treasurer of the American Ore Reclamation Co., with offices at 71 Broadway, New York, has been made also secretary and treasurer of the American Sintering Co. Eugene B. Clark, who succeeded the late James Gayley as president of the American Ore Reclamation Co., is also president of the American Sintering Co., with plants at Youngstown and Hubbard, Ohio. The offices of the two companies have been combined and are at 86 East Randolph Street, Chicago, where Mr. Reed is now located.

Raymond G. Hutchinson, chief engineer Michigan Copper & Brass Co., has resigned, effective May 1. He was with the American Brass Co. for 18 years, and from 1917 to 1921 was superintendent of its Buffalo branch. For several years before going to Buffalo he was located at the main office in Waterbury, Conn., as plant layout engineer, specializing on process work, efficiency and conveying equipment.

Leonard P. Nourie, has resigned as office manager of Manning-Maxwell-Moore, Inc., Pittsburgh, to become sales engineer with the Thomas Spacing Machine Co., Pittsburgh, handling sales in the Pittsburgh district and Ohio. He was a member of the Boston office sales force of Manning-Maxwell-Moore, Inc., for four years prior to his transfer to Pittsburgh about a year ago.

A. L. Schieber, formerly manager of the generator section, power department, Westinghouse Electric & Mfg. Co., has been appointed export representative of that department. He has been with the company since graduation from Ohio State University in 1911. His successor is Willard Lofton, who has been with the company since his graduation in 1917 from the Mississippi Agricultural and Mechanical College.

Allen B. Coffman has resigned as sales engineer of the Crouse-Hinds Co., to become manager of the Philadelphia district for the Reliance Electric & Engineering Co., Cleveland, manufacturer of electric motors. He will continue to make his headquarters in Philadelphia and will be located in the Reliance company's office at Sixteenth and Chestnut Streets.

Morris Metcalf has been elected treasurer of the American Bosch Magneto Corporation, Springfield, Mass. He was born in Providence, R. I., and was graduated from Massachusetts Institute of Technology. In 1896 he entered the employ of the Illinois Steel Co. at Chicago, and took part in the early experiments in making cement from blast furnace slag, which resulted in the organization of the Universal Portland Cement Co. He remained with this company for 20 years as assistant to the president. He was instrumental in forming the Portland Cement Association. In 1916 Mr. Metcalf went to New York to become vice-president and later president of the American International Steel Corporation. In 1921 when the corporation discontinued, he joined the Guaranty Trust Co., New York, making a trip to South America last year for the bank on a financial mission.

Lyle D. Orr, formerly general manager of the Modern Tool Co., Erie, Pa., until shortly before its absorption by the Consolidated Machine Tool Corporation, has been appointed executive manager of the Pennsylvania State Highway Department. He assumed his new duties May 1.

W. J. McDowell, formerly manager of the machine tool department, Chicago office, Fairbanks Morse Co., has been appointed middle western representative of the Buffalo Forge Co., with headquarters at Chicago. He will handle punches, shears and blacksmith tools.

Carl F. Dietz, president Bridgeport Brass Co., Bridgeport, Conn., is scheduled to address the fabricated production department session of the eleventh annual meeting of the Chamber of Commerce of the United States in New York on May 8 at the Waldorf-Astoria Hotel on "Employee Education in Fundamental Economics."

Edward J. Waltzer has resigned as president and general manager of the Wetmore Reamer Co., Milwaukee, which he re-organized in April, 1922.

Philip Koehring, secretary-treasurer Koehring Corporation, Milwaukee, manufacturer of concrete mixers, paving outfits, hoists, crane excavators, etc., has been elected president of the Rotary Club of Milwaukee. Paul E. Thomas, president Kempsmith Mfg. Co., milling machines, and John R. Ball, president Milwaukee Air Power Pump Co., were elected directors.

Joseph G. Worker, vice-president and general manager Phoenix Mfg. Co., Eau Claire, Wis., who was appointed receiver upon voluntary bankruptcy proceedings several months ago, has resigned in order to become associated with a large Eastern machinery manufacturing concern. John B. Fleming has been appointed receiver in his stead.

Eitaro Wago, president Nitto Ice Mfg. Co., Tokio, Japan, visited the plant of the Vilter Mfg. Co., Milwaukee, during the past week. He is touring the United States for investigation into the artificial ice industry and is accompanied by S. Asano, chief engineer Takata & Co., Tokio. Practically all of the ice producer equipment in 122 plants operated by the Nitto company in Japan are equipped with Vilter machinery.

W. H. Abbott becomes vice-president in charge of sales of the Wheeling Steel Corporation; H. D. Westfall, general manager of sales; Walter B. Higgins and W. L. Latta, managers of sales, as a part of the readjustment incident to the transition of the corporation from a holding to an operating company.

Alfred C. Howell, who has been appointed plate sales agent of Bethlehem Steel Co. at Bethlehem, Pa., although still a young man, has been engaged in the steel business for 26 years. He started at the Homestead mill of the Carnegie Steel Co. in 1897, and later was in the general offices of the company at Pittsburgh, continuing until 1910, when he left for Cincinnati to represent the Carnegie company and the Tennessee Coal, Iron & Railroad Co. in that territory. He was there six years, in 1916 becoming manager of the steel department of the W. Bingham Co., Cleveland. In 1919 Mr. Howell was appointed manager of the structural department of the Midvale Steel & Ordnance Co. at the general offices in Philadelphia, this department having charge of sales of plates and shapes. In 1921 he became manager of sales of Midvale and Cambria in the Philadelphia district office, in which position he continued until the consolidation with Bethlehem became effective.

ALFRED C. HOWELL

Leigh B. Morris was given a dinner by Charles B. McElhany at the Union League Club, New York, on Saturday evening, April 28. Mr. McElhany had invited some fifty friends, largely men well known in the steel business, to signalize the departure of Mr. Morris, after 30 years identification with steel selling in New York, for San Francisco, where he becomes manager of sales on the Pacific Coast for the Bethlehem Steel Company. Among those who paid tributes to Mr. Morris were William H. Donner, J. Leonard Replogle, John C. Jay, Jr., B. E. Pollak, John M. Ellis and F. H. Tackaberry. The affair, high in tone, was a notable testimonial of the regard in which both Mr. Morris and Mr. McElhany are held.

E. J. Lowry, metallurgist Hickman Williams & Co., delivered an addresse before the Malleable Chain Manufacturers Association at Hotel LaSalle, Chicago, April 27. His subject was "Chromium in Malleable Irons Discussed from the Point of View of Both Theory and Practice."

A. C. Colby, for the past two years engaged in private business, has returned to the Marshall & Huschart Machinery Co., Chicago, as sales representative. He will work in and around Milwaukee.

Dr. Charles P. Steinmetz, consulting engineer General Electric Co., Schenectady, N. Y., has accepted honorary membership in the Capt. John Ericsson Memorial Society of Engineers, as has also the former city engineer of Chicago, John Ericsson.

H. S. Schroeder, formerly manager of the New York office for the Interstate Iron & Steel Co., Chicago, has been appointed sales manager of the bar division, with headquarters in the Chicago office. F. C. Giebel has been placed in charge of the New York office, 52 Vanderbilt Avenue, and R. W. Wentworth is district sales manager of the newly established branch office at 522 Merchants' National Bank Building, St. Paul, Minn.

C. H. Sayward, formerly associated with the Cleveland and New York offices of the Niles-Bement-Pond Co., has joined the sales force of Manning, Maxwell & Moore, Inc., Boston.

Charles R. Peebles has resigned as general superintendent of the Ashland works of the American Rolling Mill Co. He has been identified with the Ashland iron and steel industry for many years and previous to the acquisition of the Ashland Iron & Mining Co.'s properties by the American Rolling Mill Co., was blast furnace superintendent of the former company.

OBITUARY

ROBERT H. STOCKTON, president Majestic Mfg. Co., St. Louis, died at his home there on April 27, aged 81 years. Death was caused from the infirmities of age and the effects of a hip fracture, suffered nearly three years ago. Born at Mount Sterling, Ky., he went to Missouri in 1857, working for a time in Columbia. He joined the Confederate Army at the outbreak of the Civil War and served as a lieutenant under General Sterling Price. Mr. Stockton began his business career in St. Louis in 1865. He worked two years in the hardware store of Pratt Fox & Co., and then entered the employ of Waters, Simmons & Co., which later became the Simmons Hardware Co., of which he was first secretary and then vice-president, which position he held until 1888, when he resigned because of a nervous breakdown. In 1892, he and L. L. Culver organized the Majestic Mfg. Co.

FLOYD CHARLES FURLOW, president Otis Elevator Co., died on April 26 at the Ritz-Carlton Hotel, New York, aged 46 years. He had been with the Otis company since 1905, when he was appointed as engineer, soon afterward becoming vice-president, then president. Mr. Furlow was born at Americus, Ga., and was educated at Georgia Institute of Technology, continuing his engineering studies at Worcester Polytechnic Institute and abroad, following lines of metallurgy and kindred sciences. For several years he pursued the profession of consulting engineer at Atlanta, Ga., and during this time lectured in experimental engineering at the Georgia institute. In 1902 he became chief engineer of the Plunger Elevator Co., Worcester, Mass., of which he became vice-president two years later.

EDWARD T. RIPLEY, senior member of Ripley & Bartlett, Plymouth, Mass., died on April 26, at his home in Plymouth in his 71st year.

PORTER B. YATES, founder and president P. B. Yates Machine Co., Beloit, Wis., died in a hospital at Chicago on April 27, after a brief illness with pneumonia. He was born in New York 69 years ago. In 1884 he established the Berlin Machine Works at Berlin, Wis., to manufacture woodworking machinery. The industry was transferred to Beloit in 1887 and later assumed the present name.

GEORGE E. SHAW, Putnam, Conn., dean of business men at that place and one of the founders of the Putnam Foundry & Machine Co., died on April 14, at the home of his daughter, in his 71st year.

DYKE WILLIAMS, president Galesburg Malleable Castings Co., Galesburg, Ill., died on April 8, at Los Angeles, Cal., from the effects of a paralytic stroke. Mr. Williams went to Galesburg from Chicago in 1907 and established the plant of which he was president. The property was twice destroyed by fire, but was rebuilt each time.

WILLIAM A. BURNHAM, president Burnham Boiler Corporation and of the Lord & Burnham Co., equipment, died at his home in Irvington, N. Y., on April 19, in his 77th year. He was also prominent as a banker.

W. H. C. GOODE, president, American Steel Scraper Co., Sidney, Ohio, died at his home in that city April 18, aged 80 years.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
April	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
25	17.00	16.75	44.20	8.00	7.75	7.40	7.05
26	17.00	16.75	44.12½	8.00	7.75	7.35	7.00
27	16.75	16.50	44.62½	7.90	7.70	7.25	6.90
28	16.75	16.50	....	7.90	7.70	7.25	6.90
30	16.62½	16.37½	44.75	7.75	7.60	7.20	6.85
May 1	16.62½	16.37½	45.25	7.75	7.60	7.15	6.80

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, May 1.

All of the non-ferrous metals are dull, except tin, which has shown some activity within the week, though at slightly declining prices. Lower prices are quoted on copper, lead and zinc as compared with a week ago.

Copper Averages.—The average price of Lake copper for the month of April, based on daily quotations in THE IRON AGE, was 17.14c., New York. The average price of electrolytic copper was 16.81c., refinery, or 17.06c., delivered.

Copper.—Copper is dull and weak and there has been a net decline in prices within a week of not less than ⅝c. per lb. Lower prices abroad have had an effect on the home consumption prices, but there has also been the usual result when buyers stay out of the market, namely, sellers with stocks on hand get impatient to sell and concessions have naturally been made. Producers have been less inclined than second hands to shade prices, but producers also have had to meet the price situation, and some would sell electrolytic for delivery over the next two or three months at 16.62½c., delivered, or about 16.37½c. per lb., f.o.b. refinery. Some quotations are as low as 16.25c. The export market is extremely dull. Some large Government stocks that were recently resold at fairly high prices are being pressed on the market.

Tin.—The tin market has been fairly active during the past week, but there has been a net decline in price. On Thursday of last weeks between 400 and 500 tons was sold at about 44.12½c. per lb. Trading was made somewhat easier by the fact that for the first time in a considerable period London and New York prices were about on a parity and several limits from London were taken. Of the lots sold on Thursday most were taken by dealers but consumers took a few parcels. Other days of last week were dull, but the first two days of this week brought renewed activity. On Monday about 150 tons were sold and on Tuesday about 350 tons changed hands. On both of these days, also, the bulk was taken by dealers. Opinions are divided as to the consumers' position. Some say they are well covered and others believe that users in general have only a small supply and will be in the market again soon. London cables report today's tin prices as follows: Spot standard, £2 13s.; futures, £2 13s.; Straits tin, £2 18s.; Singapore price, £2 16s. 5d. Deliveries of tin in the United States in April amounted to 6775 tons, which was higher than expected. Stocks on hand were 1977 tons and 1600 tons was being landed as of April 30.

Lead.—The American Smelting & Refining Co. on Saturday announced a reduction of $5 a ton in its price. Recent offerings of Spanish lead in this market were largely responsible for the decision of the leading American interest to drop its price. The market is quiet and consumers are not interested beyond watching to see what is going to happen. Quotations now are on the basis of 7.60c., St. Louis, and 7.75c., New York.

Zinc.—Consumers are taking very little interest in zinc and prices continue to show weakness. The principal demand is for small spot lots on which prices as low as 6.80c., St. Louis, and 7.15c., New York, have been quoted. One of the leading manufacturers of sheet zinc on Saturday announced a reduction of 35c. per 100 lb., making the base price 9.65c. per lb., f.o.b. manufacturer's plant. Other rolling companies are expected to make a similar reduction, which has been brought about by the decline in slab zinc.

Nickel.—The leading producer's prices are 29c. for shot and ingot nickel and 32c. for 99.80 per cent electrolytic per lb. In the outside market shot and ingot nickel are also being offered at 29c.

Antimony.—Carload lots of antimony are offered at 7.75c. per lb., duty paid, but it is intimated that this price can be shaded on parcels due to arrive soon. For May delivery 7.60c. to 7.70c. probably could be done.

Aluminum.—Offerings of 99 per cent plus are being made at 27c. and of 98-99 per cent at 26c. per lb., f.o.b. New York. Imported grades are quoted at approximately these prices. Remelted aluminum can be bought at 25c. to 26c. for the 98-99 per cent quality and at 23.50c. to 24.50c. for the No. 12 alloy.

Old Material.—Business is very dull and values are slowly easing off in sympathy with the virgin metal market. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	16.25
Copper, heavy and wire	14.75
Copper, light and bottoms	13.00
Heavy machine composition	12.75
Brass, heavy	9.75
Brass, light	7.50
No. 1 red brass or composition turnings	11.50
No. 1 yellow red brass turnings	9.00
Lead, heavy	7.25
Lead, tea	5.75
Zinc	5.25

Chicago

MAY 1.—All of the metals, virgin and old, have declined without exception. Recent advances apparently were overdone and a buyers' strike is under way. Consumption, however, remains heavy in all lines and a resumption in buying is looked for as soon as prices find a new level. Users' stocks of lead and zinc are particularly low. We quote, in carload lots, lake copper, 17c.; tin, 46.50c.; lead, 7.75c.; spelter, 6.90c.; antimony, 9.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 13.50c.; copper bottoms, 11.50c.; red brass, 10.50c.; yellow brass, 7.50c.; lead pipe, 6.00c.; zinc, 4.25c.; pewter, No. 1, 28.50c.; tin foil, 31.50c.; block tin, 37c., all buying prices for less than carload lots.

The Dravo Contracting Co., Pittsburgh, launched at its Neville Island yard, April 20, the George H. Walker, a railroad car transfer steamer for the Gulf Coast Line Railroad, which is the largest river ship in the world. The Gulf Coast Line, the Illinois Central and the New Orleans, Texas & Mexico railroads will use the steamer in carrying on a train service between Baton Rouge and Anchorage, La., where the Mississippi River is so wide that a bridge would be impractical. The steamer is capable of conveying between these points a complete train consisting of the largest engine now in use, together with 11 steel Pullman cars or 25 loaded freight cars, at a single crossing.

A new use for brass was marked at Atlantic City, N. J., April 18, when the Postoffice Department placed brass mail boxes at mail collection points along the boardwalk. This step was taken to reduce the heavy maintenance expense due to the rusting of the steel boxes, the average life of which was about three years. Atlantic City was selected for the first use of the brass boxes because the sea air is particularly severe on the steel, it being necessary in some cases to replace boxes along the boardwalk in as short a time as three months.

Active contact with more than 340 various industries has been had and a wealth of information and experience has been developed in connection with the movement to bring about simplification, according to E. W. McCullough, manager of the fabricated production department of the Chamber of Commerce of the United States, Washington.

Can France and Germany Be Allies in Steel?

The Ruhr Occupation from the Standpoint of French Industry —No Plan for "Destroying" the German Machinery of Production

BY VICTOR TRUANT

To the Editor: I have read with care the articles Capt. Godfrey L. Carden has written for THE IRON AGE following his recent visit to the Ruhr district. I especially noted the declarations made to your correspondent by Dr. Reichert, member of the Reichstag and general director of the Central Union of German Iron and Steel Industries. Certain assertions of Dr. Reichert I deem fallacious and absolutely inexact. I hope, therefore, that you will permit me to refute them.

First of all, neither France nor any other country has dreamed of "destroying the German machinery of production." Why should the French be held foolish enough to have a will to destroy that German industry from the productivity of which they are expecting the bulk of the reparations due to them?

France's Ability to Operate the Ruhr

The French nation, massed behind the head of its Government, wishes indeed to come to a peaceful understanding with Germany; but what we Frenchmen are especially objecting to is to evacuate the Ruhr before that understanding has been reached, our present occupation of the Rhenish-Westphalian district being our only pledge for obtaining from Germany the execution, at last, of the treaty of Versailles.

France, whose population within its metropolitan frontiers represents hardly two-thirds of the present population of Germany, does not have, of course, the necessary labor supply to run all by herself (I mean without the cooperation of German workers) the collieries and works of the Ruhr district. But it is time that the world should realize that, if she wanted to—as she does not—France would be quite able, with her engineers, her technicians and her specialist workers, to direct and carry on the complicated and enormous organism of the Ruhr district. What France has achieved, since the armistice, as regards restoring her devastated works and restarting the Lorraine iron and steel industry is a convincing proof of it.

French Ore for German Fuel

As to the combination which Dr. Reichert speaks of between France's ore riches and German coal mines, none more than ourselves have been in favor of the conclusion of an agreement that would realize it. But while we were placing at the disposal of German metallurgists all the iron ore they wanted, the latter, in order simply to boycott our produce, purchased in Newfoundland and in Sweden iron ores at very high prices.

On the other hand, German coke deliveries under the Versailles treaty kept increasingly below the limit, and this was one of the causes of our occupation of the Ruhr.

I may add that since that time (Jan. 11, 1923) German metallurgists have been refusing to take delivery of French iron ore sold to them by private contracts, and the ore so undelivered is now blocking our pit heads.

I repeat that the French are absolutely prepared to conclude with the Germans an agreement for the exchange of French ore for German coke. I shall add that some of my countrymen are even going farther and suggest the delivery to the Germans—whom the return of Alsace-Lorraine to the mother country has impoverished in pig iron supplies—of tonnages of raw and semi-finished products, which Germany could transform into finished products or use in the mechanical or electrical industries. I must say, however, that the latter suggestion is not meeting with the approval of all the French industrialists, some of whom object to strengthening in that way the competition of German manufacturers. However, the controversy remains open.

No Franco-German Alliance Against British and American Trade

Yet, if it is true that an agreement on the above lines could easily be come to between French and German interests, we differ from the German views as expressed by Dr. Reichert on one important point, namely: We do not partake of the impulsive desire, innate in our opponents, to turn against Great Britain or America any Franco-German convention that would be concluded. Of course, we French, Belgians and Luxemburgers are endeavoring to produce at the lowest possible costs; and to attain that end we are led to export the surplus of our production, exactly as Americans and Britishers are doing themselves.

But it cannot be said that our efforts in that direction, which are of vital importance for the development of our iron trade, are specifically directed against the exporting power of our friends across the Atlantic, nor against that of our friends across the Channel.

Lowered Production Costs

Of course, one of the consequences of a Franco-German agreement would be to reduce considerably production costs. But it should be considered also that the very working of that agreemnt would tend to appreciate the value of both French and German currencies and so counterbalance, for Great Britain and America, the disadvantage of greater competition from France and Germany due to any decrease in the costs of the latter countries.

Incidentally I observe that Dr. Reichert, like every good German, speaks of the poor life of German laborers and ascribes it to the consequences of the Versailles treaty. It is really too easy to answer him that he should ascribe it only to the doings of the German state and of the magnates, who, ever since the signing of the peace treaty, have been scheming the devalorization of the mark and thus have raised the cost of living in Germany to fantastic heights, for which wage advances have but partly compensated.

Dr. Reichert mentions French export premiums. These, which were suppressed on Feb. 15 last, were borne by all the French consumers of coke, since they were paid out of the pooling fund created for the adjustment of coke prices.

The Iron Ores of Lorraine

I conclude: The old French province of Lorraine was entirely reinstated under French dominion in 1918. It would then have been absurd, and even impossible, to leave the Germans in possession of the iron ore existing in that part of Lorraine just returned to the mother country. When in 1871 Bismarck imposed upon us the treaty of Frankfort, he knew full well that the part of Lorraine he annexed to Germany contained iron ore deposits, and had he been aware at that time that these

deposits extended further west no doubt he would have annexed also those patches of Lorraine land, including the Briey district, which formed the northern part of the French department of Meurthe-et-Moselle.

If in 1918 we won back the iron mines of Lorraine which Bismarck had taken from us by sheer force of arms, we have not on the other hand annexed by right of conquest one single German mine proper; and if the Saar coal field was ceded to us it was simply as a compensation for the German destruction of our collieries of the Nord and Pas-de-Calais.

Why, therefore, speak of our obstructing the new industrial balance of the European continent? We have the ore, and to the Germans, who have the coke, we offer an exchange of both products. But we do not want any more the industrial hegemony of Germany. We suffered too much from it before 1914, and on the other hand we cannot and must not forget that vanquished Germany is to repair the wrongs she inflicted not only upon ourselves, but also upon humanity.

If, now, the German republic and the industrial magnates who are now exerting a paramount influence upon its destinies set themselves to the task of repairing the gigantic havoc wrought by the mad ambition of Germany's rulers, and if they are willing thus loyally to satisfy the dictates of justice, they will always find us ready to collaborate with them to the economic development not only of both our countries but of Europe and of the whole world.

PARIS, April 15.

MORE MEN EMPLOYED

Foundries at Canton, Ohio, and Elsewhere Working at Capacity—Labor Shortage Continues

Every foundry at Canton, Ohio, with the exception of one, is on a capacity basis and extensive additions have been made in working forces during the past few weeks. A number of plants, including the Dayton Malleable Iron Co., have adopted a double shift schedule. The idle plant is that of the Canton Steel Foundry Co., affiliated with the Morgan Engineering Co., Alliance, Ohio, specializing in heavy locomotive castings. It is said that this foundry will be placed on the active list within the next month. Other local plants are running full, with orders on hand to insure maximum output for some weeks. These include the Arctic Ice Machine Co. and the Diebold Safe & Lock Co., both of which are giving employment to large working forces. The Republic Stamping & Enameling Co. has increased production through a number of plant improvements and the installation of additional equipment. This plant is operating with a quota of 700 men and would add from 250 to 300 more operatives if they were available; a call is out for laborers and skilled workers. The Canton Stamping & Enameling Co. is also busy.

The Electric Storage Battery Co., Philadelphia, is running full at its local plant, with a greater volume of business than ever before in the history of the company. The new works at Crescentville is operating at close to two-thirds of capacity and, with the completion of the plant in the near future, will be placed on a maximum turn; the installation of equipment is being pushed. The company is now giving employment to 4000 more men and women than ever before on the payroll.

Metal-working plants at Kokomo, Ind., are developing production closely paralleling war-time activities, and practically all iron, steel, brass and other kindred industries are operating at maximum. The Kokomo Steel & Wire Co. is giving employment to more than 1000 operatives and expects to add additional workers in the near future. The local group of iron and brass mills has more than 1700 employees now on the payroll, these plants including the Kokomo Brass Works, Kokomo Malleable Iron Works, Inc., Kokomo Stamped Metal Co., Kingston Carburetor Co., Kokomo Electric Co., Kokomo Lithographic Co., and the Hoosier Iron Co. The Haynes Automobile Co. has advanced production and is now employing more than 1200 persons; additions, it is said, will be made to this force when workers are available. The Globe Stove & Range Co. is running full, with the employment of about 350 operatives. The Superior Machine & Tool Co. is giving work to 200 persons and proposes to advance this force in the future. The Apperson Brothers Automobile Co. has close to 400 workers on the payroll and is engaging on a maximum production schedule.

Following a recent advance of 10 per cent in wage schedule for rolling mill employees, the Singer Mfg. Co., Elizabeth, N. J., has made a similar increase in the scale for all employees on a piece work or hourly basis at its local plant, devoted to the manufacture of sewing machines and parts.

Laborers at the plant of the Weatherly Steel Co., Hazleton, Pa., out on strike for a week with demand for increased wages, have returned to the mill and operations have been resumed. The men demanded 50c per hr. and 8-hr. working day. A settlement has been made on the basis of an increase of 10c per hr., or close to the maximum asked; half holiday on Saturday, and 9-hr. working shift.

Jones & Laughlin Steel Arrives in St. Louis by Boat

ST. LOUIS, May 1.—The first through shipment of steel from Pittsburgh to St. Louis by the fleet owned by the Jones & Laughlin Steel Corporation arrived in St. Louis on last Tuesday night. The shipment consisted of two barges of structural steel and one barge of pipe—2500 tons—towed by the steamboat Aliquippa.

Previous shipments by Jones & Laughlin have been transferred to rails or the Mississippi-Warrior service (Federal barge line) at Cairo. The Aliquippa returned to Cairo immediately to pick up two barges loaded with pipe and one barge with structural shapes for Memphis.

The tow, which left Pittsburgh on April 14, is a part of the fleet of eight towboats and 230 barges owned by Jones & Laughlin for delivering its products by way of the Ohio and Mississippi.

The tow was met at the North Market street docks on Wednesday morning by a reception committee. The members of the crew and the steel officials were the guests of the Chamber of Commerce at luncheon.

The speakers were Congressman Newton of St. Louis and C. W. Gottschalk, assistant traffic manager of the steel company.

Coke Production Curtailed

UNIONTOWN, PA., April 30.—Production of coke in the Connellsville region is being curtailed to meet the demands. Slump in shipments has been brought about largely by embargoes to piers and decreased export shipments. The slump also has been reflected in some slight reductions in prices, although these reductions have been largely in the disposal of distress shipments caught without destination. For the week ending April 21, merchant operators production fell off 5070 tons over the preceding week. Furnace production was slightly augmented. One hundred and five ovens were added to the active list at furnace plants and 184 blown out at merchant operations. The net loss in coke output during the week was 2350 tons from the preceding week.

Production for the week ending today will show a further decrease. Coke operators generally are cutting their sails to fit the cloth. Despite the slump, market prices remain firm and new contracts are being made. No sharp decrease in prices is anticipated.

Coal market continues weak with a decrease rather than increase in production. By-product coal, however, is firm, moving to by-product ovens.

Important Problems at Washington

Secretary Hoover Closely Studying for Facts Relating to Immigration and Efficiency of Labor

BY L. W. MOFFETT

WASHINGTON, May 1.—With the question assuming a rank of utmost importance in the social and economic world today, the iron and steel and other industrial people of the country are manifesting considerable interest in the study being prepared by the Department of Commerce under the direction of Secretary Herbert Hoover for the purpose of establishing economic facts bearing on immigration and efficiency of labor.

The survey will cover the period from 1914 up to the present. This period was selected because in 1914, it was pointed out, immigration practically ceased and it is desired to determine as definitely as possible the effect of restricted labor supply. Mr. Hoover declared that the efficiency of labor had increased greatly during the past decade and that the fairly continuous shortage of labor had put a tremendous impulse behind management for increasing labor efficiency. It is accepted as a foregone conclusion that overwhelming sentiment of the country is strongly in favor of selective and restricted immigration. Therefore, a study of the kind that has been undertaken will prove of educational value to employing interests and further methods of management looking to a decreased turnover of labor and increased output per man, and at the same time the holding down of costs of production.

The iron and steel industry, as is well known, already has accomplished a great deal in these directions during the past decade and is intensifying its efforts at this time for further improvement. It also is true that industry itself, like Government officials, and members of Congress, is giving closer study to the social side of the problem which is closely related to, but, in the opinion of Secretary Hoover, outranks the economic phase.

Improving Human Relations

The iron and steel industry is taking a leading part in associating these two features as is denoted by its activities in furthering the development of human relations between employers and employees. On the economic side, there is a growing tendency in the industry to bring about greater efficiency by encouraging increased production per man through a series of inducements, among which is the shifting of the plan of compensation to a tonnage basis in place of hourly or daily basis.

Stimulus likewise has been given to study of the business cycle, looking to the planing out of the "peaks" and the lifting up of the "valleys" so as to meet on a more nearly common line, looking to the stabilization of demand and supply and steady employment. It is generally recognized that industry as a whole has a long way to go before accomplishing such a continuous balance between demand and supply, but at the same time, an encouraging start has been made, an example of which is the comparatively new policy of automobile makers to spread out their demands for sheet steel throughout the year, rather than rushing into the market at stated periods of extreme activity, with the unhappy results that inevitably have taken place in the past.

Manifestly stabilized industry brought about by means suggested reflects an increased efficiency of labor, which together with improved mechanical efficiency has been a big factor in preventing costs of production from rising to excessive heights. It is hoped that the study being made by the Department of Commerce will illuminate these points a great deal.

Restricted Immigration

Restricted immigration having compelled industry to depend much more largely than before upon recruiting employment from sources of supply already within the United States, steps in this direction are being considered by iron and steel and other interests which have not already developed this plan. But even more important perhaps is the point that the curtailing of immigration has focused the attention of employers more intensely than ever on the question of wastage of labor. In this connection, it is understood that coal operators, acting upon their own initiative, have approached a prominent student of labor affairs and asked that he reorganize the coal industry. This, it is stated, looks to the education of large consumers of coal, as well as the public generally, to the necessity of storing coal, a matter that also is being studied by the Department of Commerce, so as to provide continuous operation of mines, so far as possible throughout the year and consequently obviate abnormal demands in the fall and winter, and likewise relieve resulting congestion of transportation. Moreover, it is stated that it will make possible a great reduction in the number of miners necessary to produce coal requirements of the country and release many laborers to manufacturing establishments of the country. The Department of Commerce in its study looking to the elimination of waste in transportation also is receiving many constructive suggestions from trade associations and business organizations.

The Surplus of Miners

The statement recently was made by Ethelbert Stewart, Chief of the Bureau of Labor Statistics, Department of Labor, that 700,000 men in coal mines of the United States are idle more than half of their time and that if 25 per cent of the higher types of coal mines were operated 306 days in the year employing 60 per cent of the men now in the industry, they would produce all the coal that the country could use or export. In other words, it was asserted, that an average of 250,000 men in this industry must be out of work all of the time who could be used in other lines of occupation. Mr. Stewart pointed out a number of other industries, which, he said, are wasting a great amount of labor.

Full discussion of immigration modification proposals made by the immigration committee of the Chamber of Commerce of the United States and also of the proposals of Representative Albert Johnson, chairman of the House committee on immigration, is provided for in the program for the Civic Development group meeting at the National chamber's annual meeting in New York May 8-11. John W. O'Leary, vice-president of the Chicago Trust Co. and chairman of the National chamber's immigration committee, and Representative Johnson will both address the session in support of the immigration plans each advocates.

Mr. O'Leary's committee recommended that the present emergency immigration act restriction of 3 per cent quotas be retained, but that an additional 2 per cent quota be provided for, the immigrants to be admitted under the additional quotas to be subjected to higher tests, mentally, physically and morally. The committee also recommended that the executive branch of the Government be empowered to grant admissions within the 2 per cent additional quota limit on the basis of a

demonstrated need for immigrants of a particular type. The purpose of the committee was to provide for a thorough test of the practicability of applying a selective method to immigration control with a view to formulating a national immigration policy based on that method if it proved successful under test.

Mr. Johnson's New Bill

Chairman Johnson has prepared a bill for presentation to the next session of Congress which he believes will cure some of the difficulties that have arisen under the present emergency act. It is understood that he will propose to reduce quotas for admission from 3 per cent of nationalities as shown by the 1910 census to 2 per cent as shown by the 1920 census. His bill also provides for new administrative features and he will explain it in detail in New York, the topic assigned to him at the group meeting discussion being "Immigration and Labor Needs." The other speakers will talk also from this angle or from the Americanization point of view, and it is expected that the group meeting will recommend a course of action to the annual meeting.

Believes Present Prosperity Will Soon End

President Biggert Sends Message of Warning to Employees of United Engineering & Foundry Co.

IN a message to employees of the United Engineering & Foundry Co., with plants at Pittsburgh, Youngstown, Canton and Vandergrift, Pa., President F. C. Biggert, Jr., predicts that the present expansion of business is doomed to a short life by the very nature of its inception.

"Absolute necessity planted it in a shallow soil, badly prepared," he states. "It sprouted when we were in a depression which had not lasted long enough to equalize the unbalanced aftermath of the war. We were ten years behind in the maintenance of our national equipment. Housings, roads, railways and what not had been neglected to the point where active development must be immediately resumed. This situation was well suited to a substantial and continued rise of business, but we, the people, were not ready.

"Extravagance, inefficiency, unbalanced prices and speculation, the usual companions of inordinate prosperity, were still with us. The depression had not been long enough to separate us from them. They had gone into partial retirement but were near at hand, ready for instant call. They are now being called. They will come—and nip the bud and spoil the fruit.

"Do not misunderstand me. I am not a pessimist. I know that there is a huge amount of work to be done. I believe that the coming years will see undreamed developments in all parts of the world and particularly in our own country.

"What I believe I foresee is the accomplishment of much of this work by fits and starts instead of the well-regulated, uniform flow by which it should be accomplished. I think that for some years there will be peaks and valleys in our national production line. If this should happen, speculation will gather huge profits, while industry and the worker will average low in returns. Note that I say 'will average low,' for the high wages and profits of the peaks will be leveled down by the low returns in the valleys and the net results to industry will not be satisfactory.

"Again, do not understand that I would lie supinely by and make no move to prevent this undesirable condition. My very object in addressing you as I have is to strike a blow against inflation. So far as the immediate situation is concerned, I do say that the stage is set and cannot be greatly changed, but this applies only to the present. After this wave will come another and yet another and whether these be succeedingly less violent or more, depends largely upon the attitude of the people and particularly the management and the workers in industry. The principal control is in the minds of the people.

"We are extravagant. We think we must have this or that convenience and, if possible, we get it. . . . We need houses, but build automobiles. Our railroads are depreciated, but we waste our energy upon electrical toys. We ask for bread and receive a stone. Our national extravagance is surely a root of our inflated condition.

"We have, as a primary cause of the present tendency toward inflation, the unbalanced prices with which this increase in business started. Coal and the cost of building were too high. Farm products, steel and copper were too low. Taxes were high and tending to go higher. Rents were high and going higher. Molders' and machinists' wages were low by comparison with those of carpenters and coal miners and so on.

"When there was no longer any possibility of putting off the urgent needs of the country, there came an insistent demand to raise the low items to meet the high ones. No one, for a moment, thought of lowering the high to proper relation with the low, yet this would have been the better adjustment. Our national tendency to level prices up instead of leveling them down is at the root of this present inflation.

"Out of extravagance, inefficiency and unbalanced prices grows speculation. Without them it cannot exist, for speculation depends upon a fluctuating market for its profits. It is not a primary cause of inflation but a powerful accelerator which seizes upon small increases in prices and boosts them far beyond their normal rise. By speculation I mean unwarranted buying when prices are already high with the deliberate intent to still further increase them; not the legitimate speculation which is economically sound and actually has a stabilizing influence. We have today too much of a tendency to this improper form of speculation. It will have a large share in this and future periods of inflation unless the conditions upon which it flourishes are removed.

"All these: extravagance, inefficiency, unbalanced prices and speculation, must be controlled by the attitude of all the people. If we encourage them, we may expect great fluctuation of business, feast and famine, luxury and poverty. If we frown upon them, we may have continued comfort and infinitely greater satisfaction.

"How far we go in one direction or the other will depend upon the number of people who take each course. You are each a factor in the net result by your own course and by your influence upon others. Which way will you go?"

Ruhr Occupation Affects Sales of Wabana Iron Ore

The sale of iron ore by the British Empire Steel Corporation from its Wabana mines in Newfoundland has been adversely affected by the French occupation of the Ruhr district. D. M. McDougall, vice-president of the corporation, who has just returned from a trip to Europe, stated: "In regard to Wabana ore the present conditions do not indicate that there will be any extensive sales made this year, or sales to Germany. There are two factors: one is the taxation imposed by the French and another the new regulations by Germany. These latter have only become known within the past few days, and we are not yet in full possession of the details." During the year 1922 the British Empire Steel Corporation disposed of about 750,000 tons of Wabana ore to German steel interests.

Employee Representation Plans at Work

Analysis of Sixteen Kinds in Operation in Cleveland Stresses Sincerity and the Spirit of Cooperation—Outside Arbitration Not a Factor and Not Needed

BECAUSE of the widespread interest in plans for the peaceful settlement of employer-employee differences, the Cleveland Chamber of Commerce, through its committee on labor relations, has made a study of plans for employee representation in Cleveland, and has issued its report. Approximately 600 firms were canvassed by means of questionnaires or personal visits. From the material collected, 16 well-developed examples of employee representation were selected for the report. The companies having plans in operation include American Multigraph Co., Bourne-Fuller Co., Browning Co., Hydraulic Steel Co., Lincoln Electric Co., Reliable Stove Co., Westinghouse Electric & Mfg. Co. (Cleveland plant), White Motor Co., White Sewing Machine Co. and Willard Storage Battery Co.

The plans, affecting approximately 23,000 workers, provide for friendly negotiations and discussion between representatives of the employer and elected representatives of his employees regarding wages, hours and all other matters properly affecting their relationship.

While in some instances these plans are intended to promote departmental cooperation, increase efficiency and production, or reduce labor turnover, in most cases the fundamental reason for their installation was a desire to improve the relations between the employer and the employee. One of the most interesting parts of the report is a section on executives' opinions concerning essentials for employee representation, which summarizes the considerations which the executives, connected with the plans in the report, considered fundamental to success. Some of these considerations are:

1—*Sincerity and Cooperation:*—Sincerity of purpose, frankness and a desire for right labor relations are the basis of successful employee representation. But a mutual spirit of cooperation must be present before this desire can be transmuted into an actuality.

2—*Economic Education and Information:*—In connection with the installation of employee representation, it is advisable to educate the employees as thoroughly as possible regarding sound economics and its relation to the business, in order that they may be assisted to consider labor relations from a sound viewpoint. In this connection it is helpful, in some instances, to present for their consideration such economic facts and statistics relating to the business as will enable them to comprehend the effect on the business of proposed changes in employment conditions.

3—*Simplicity of Plan:*—Organization for employee representation should be as simple as possible, to permit the most direct contact between the employee representatives and the management. The delay resulting from a complicated method for considering employee recommendations may irritate the employees or cause the loss of their interest in employee representation.

4—*Immunity from Discrimination:*—Representatives of employees selected by and from their own number should be assured by their employer that no discrimination will be made against them because of anything said or done in their representative capacity. Otherwise the management cannot hope to obtain the high degree of frankness and confidence necessary for successful employee representation.

5—*Franchise Qualifications:*—With proper restrictions to insure mature intelligence and permanence, such as age, length of service and citizenship requirements, every employee should be eligible to vote and to hold office.

6—*Employee Supervision of Elections:*—All elections should be conducted under the supervision of an employee committee. The management should not attempt to influence in any way the selection of employee representatives.

7—*Scope of Activities:*—There should be no limitation preventing employee representatives from considering and formulating recommendations regarding any phase of the company's activities concerning hours, wages and all other matters properly affecting their relationship. Any attempt to restrict committee activities tends to restrict employee cooperation and to undermine confidence in the management's sincerity.

8—*Prompt Action:*—All employee recommendations not approved by the management should be returned to the committee originating them with a complete statement of reasons for the management's action. No recommendations should be pigeon-holed.

It was found that 11 of the 16 plans were installed between the years 1916 and 1919, and that there were no plans in plants employing less than 300 persons. It was the consensus of opinion among the executives interviewed that the choice of the basis of representation depends to a large extent upon the size of the plant. It was felt that all groups of employees should have adequate representation, both geographically and by crafts. In the plans in the report, the employee representatives are elected by one of the three following methods:

1. They are elected at large from a list of all eligible employees in the plant;
2. One representative is elected from each department or voting division;
3. Each department or voting division elects a number of representatives in proportion to the total number of employees in the department or division.

In most of the plans the only qualifications for nomination and election as employee representative are length of service, citizenship and age qualifications. It is usually required that an employee must have worked continuously for the company for a period varying from six months to one year, in order to insure reasonable permanency with the organization and that he will have a fair knowledge of the plant and its conditions. Just as citizens are required to have reached a certain specified age before being eligible for election to Congress, so in most instances candidates, desiring to be elected as employee representatives, must be of legal age in order to protect the employees' interests against ill-considered recommendations by immature representatives. A majority of the plans require that employee representatives be citizens of the United States or at least have their first citizenship papers in order to insure that they have an adequate knowledge of our ideals and customs.

The committee did not find any instances where employees are not eligible to serve as employee representatives because of their affiliation or non-affiliation with any particular organization. In some cases those employees having supervisory functions or power to hire and discharge were ineligible in order that all representatives may have, as far as possible, the employees' viewpoint and entirely represent their interests. In most instances eligible candidates automatically became nominees or are nominated by secret ballot. Similarly, in 14 of the 16 plans included in the report, representatives are elected by secret ballot and in two, by the open ballot of the employees. Most employers believe that the management of elections should be left entirely to the employees. The plans studied have no restrictions barring any given class of employees from voting, except those exercising managerial or semi-managerial functions.

In most instances the companies do not attempt to restrict the subjects which employee committees may discuss with the management. There was a general feeling among the executives of the plants having employee representation that any attempt to limit the scope of the committee's activities tends to limit the committee's usefulness, suggests a lack of confidence or frankness on the part of the management and, therefore, tends to weaken the employees' confidence in employee representation. Eleven of the plans included in the report provide that the employees may consider any subject related to the business; five provide that they may consider any subject affecting employment conditions.

All Disputes Settled by Friendly Discussion

Recommendations of the employee committees, in nine plans, go directly to some final authority authorized to approve or disapprove them. In five cases, they are sent to a committee composed of management representatives and, upon receiving the approval of this

committee, are forwarded to the final authority. In most instances this final authority is the chief executive of the company or a committee of major executives, in all cases subject to the veto of the board of directors. Except in one plan, there is no provision for the arbitration of differences between the employee representatives and the management. The committee did not find any instance where there had ever been a request by the employees for outside arbitration. In all cases, differences had been settled by friendly discussion within the plant. In all plans, when employee recommendations are disapproved, a full explanation must be given to the employees. When the management wishes to introduce a change affecting the employees' interests, the proposed change usually is submitted to the employees' committee for their approval or suggested modification.

It was generally recognized by the executives of the plants having employee representation that frankness and sincerity of purpose as well as cooperation are the basis of successful employee representation. As a result, in 15 of the 16 plans, it is mutually understood by the employer and his employees that there will be no discrimination against employee representatives because of anything said or done in their representative capacity. In line with this same thought, most of the plans provide that minutes of committee meeting shall be posted in the shop, printed in the plant magazine, or kept on file for the inspection of employees.

There is no tendency to combine profit sharing and management sharing. There is only one plan which operates a system of profit sharing in connection with its plan for employee representation.

Better Understanding and Morale

In almost all cases the executives connected with the employee representation plans felt that these plans had created a better understanding between the management and the employees. In 11 instances it was stated that employee representation had improved the morale of the organization. Seven executives noted decreased labor turnover which, they felt, could be attributed largely to their shop committees. In six cases the plans developed a more intelligent cooperation on the part of employees. In other plants the results were stated to be increased efficiency and production, the development of intelligent leaders among the employees, the promotion of the employee's economic education, and the production of suggestions reducing costs and improving conditions. Although the depression of 1920 and 1921 seriously interfered with the ability of these plans to function, the committee found no inclination on the part of any of the 16 companies which had introduced employee representation to discontinue their plans.

Five plans, also included in the report, have been discontinued for reasons not directly related to the ability of employee representation to promote better labor relations. The plan of one wholesale and retail automobile accessory firm failed because of the factions and ill-feeling resulting from competition for sales. In one manufacturing plant the plan failed largely because the management had never been wholeheartedly in favor of it. A third plan, which had functioned satisfactorily in a garment manufacturing plant, was discontinued when the local garment industry became unionized. Another plan which had a profit sharing feature failed because there was dissatisfaction with the method of profit sharing. In the fifth plan, the representatives were not elected. The plan was installed during the war to enable the management to discover any radical activities within its organization. Following the war it was discontined.

In this report, the committee does not attempt to determine the extent to which the plans, included in the report, in actual practice conform with the principle of representative negotiation as defined in the Chamber's "Declaration of Principles" in labor relations in Cleveland. It merely analyzes them for the benefit of those who are interested in the subject. It is a fact-finding report of what is being done in Cleveland to develop methods of negotiation between employers and employees.

COMPETING FOR LABOR

Danger That the Folly of Other Years Will Be Repeated in Michigan This Year

DETROIT, April 28.—The industrial situation in Michigan, which is guided largely by the automotive industry, is threatening to produce a competitive labor market similar to the same period in 1920. Detroit manufacturers generally report a straight advance of 15 per cent in all lines since the last quarter of 1922, and in some cases the wages of common labor and semi-skilled workmen have increased 50 per cent. While the Detroit Employers' Association shows a total of 225,081 employed by the 79 reporting firms as of Tuesday, April 17, and this is the highest employment record in the history of the city, there has in reality been a shortage of labor in the city for six months and it is today below the point that would enable manufacturers to reach a production equal to demand. The above figure is an increase of 1302 over records of a week ago. Reports show that there are about 4000 men moving into Detroit each week due to the vigorous efforts of the manufacturers in scouring the neighboring States and the South. This situation works to the disadvantage of the industries in other Michigan cities. Automobile manufacturers have had to limit their production on account of a shortage in malleables and in most instances the gray iron shops have been able to furnish castings sufficient for current needs only on a daily delivery basis. This is due directly to a shortage of molders and foundry labor which applies to the stove and furnace manufacturers, and all melters are handicapped by the present situation. The manufacturing centers in Michigan, outside of Detroit, have always had the advantage of farm laborers during the winter months, and many of these worked in foundries, but this class of labor has been diverted to other departments of automobile manufacturing due to equal or higher wages under more attractive working conditions. Apprentice molders are practically extinct, as production molding demands machines that need an operator who is a laborer or a semi-skilled workman at best and this class is finding better working conditions in other lines of manufacturing.

Officials of the Associated Building Employers of Detroit report that the constant advance in wages of various crafts in the building trades has caused a curtailment of more than $3,000,000 of building operations for this city. There is no indication, however, that small and home building will cease, as the month of March sets a new high record for permits issued. Employers are perturbed as to the immediate future, when outside construction work will draw heavily on these rolls.

The Bridgeport Brass Co., Bridgeport, Conn., in a neatly printed pamphlet describes briefly some of the numerous activities which the company carries on in connection with the employees. An important feature of this relation is that workers are told the real facts of the business. The general manager explains the results of the business at shop committee meetings so that any employee can easily understand. The giving of two weeks' vacation with pay to the workers is also a feature.

The Wisconsin Senate has killed the so-called Tucker bill which aimed to provide a general 8-hr. workday in factories, mills and other industrial establishments, exempting only farmers. This effectually disposes of agitation for a general 8-hr. day law in Wisconsin until the next session in January, 1925.

FOOT CONTROL REDUCES COSTS

Its Success in a Steel Mill Suggests Similar Uses in Other Plants

BY G. J. WALZ*

WHILE studying ways and means for reducing operating costs, there occasionally arises a situation where use can be made, to good advantage, of the fact that a man can operate controllers with his feet, as well as with his hands. A foot-operated controller, of course, is not a new thing today; but sometime ago we put in an installation of foot-operated magnetic controllers, which worked out to excellent advantage. This installation is used, in conjunction with an engine-driven reversing mill, which requires, of course, one man to operate the steam engine—but the use of foot-controllers enables us to operate all the rest of the mill, with only one other man in the operator's pulpit.

This man operates with his left foot the master controller, which runs simultaneously both the front and rear roll tables, in one direction only, causing the bloom to travel away from the operator. With his right foot he operates another master, which drives the same tables in the opposite direction, moving the bloom back toward the operator. With his left hand he operates a roll table beyond these two tables, which takes the piece away from the mill, after the mill is through with it, and also the left side-guard, which is, of course, on both sides of the main rolls. With his right hand, he operates the right side-guard, and the finger manipulator, which turns the piece over. To prevent time from hanging heavily on his hands, or feet, he also has to operate a valve, which blows a jet of steam on the piece during the last pass, to blow the scale off, and he also handles the valve which regulates the flow of water on the main rolls.

One peculiar result of thus cutting the pulpit operating force down from three to two men was that this change actually speeded up the operation of the mill, probably 25 to 30 per cent, because there was less of one man's waiting on the movements of another, and the control was more centralized. I furthermore noticed, recently, that the operator on the one turn uses only one of his feet, for both foot-switches. Now I feel sure that, just as soon as we are able to replace the steam drive on the main rolls with electric drive, we can make use, somehow, of that other foot—probably to operate the main rolls.

We will then have, in place of three men, who had lots of time to talk to each other, one man who is pretty busy, who earns more than he did before and is therefore better satisfied, and we will get out as much product as before, or probably more. While the operator sits in a comfortable, especially constructed chair, he operates the foot-switches just like an automobile accelerator, for a man's foot is extremely sensitive at this sort of work. Of course, it took two or three days in the beginning for him to become accustomed to the novelty of the operation but, after that, it all worked smoothly.

In a case like the above, it is best to place the man who is displaced on another job elsewhere—then one can always call on him, as a spare man; and to give the man who is doing the work of two men somewhat more money, which should come back in increased production.

*Assistant electrical superintendent Bethlehem Steel Co., Steelton, Pa. This brief paper was read before the Association of Iron and Steel Electrical Engineers.

MERGER OF AXLE PLANTS

Torbensen Company Buys Eaton Works as Step in Formation of Large Organization

The Torbensen Axle Co., Cleveland, has purchased the Eaton axle plant of the Standard Parts Co., Cleveland, as a step in the formation of one of the largest spring and axle companies in the country. This will include, in addition to the Eaton and Torbensen plants, the Perfection spring plant, Cleveland, and the Pontiac spring plant, Pontiac, Mich., as well as service stations in New York, Boston and Cleveland.

The latter plants and service stations were recently sold by Frank A. Scott, receiver of the Standard Parts Co., to banking interests represented by Burton A. Howe, Grand Rapids, Mich. The purchase price of the Eaton plant was $1,125,000, and the sale to W. D. Turner, in behalf of the Torbensen company, was approved in the Federal Court in Cleveland April 18. The purchase price of the Perfection and Pontiac spring plants was $1,025,000. The capital stock of the Eaton Axle Co. will be increased, and its name will be changed to the Eaton Axle & Spring Co. It is announced that the output of the combined plants will be about 150,000 sets of axles per year and 10,000 springs per day, and that the merged plants will have an annual sales volume of business between $20,000,000 and $25,000,000.

J. O. Eaton, president Torbensen Axle Co., will be at the head of the new company. Mr. Eaton started the Torbensen Axle Co. in Newark, N. J., in 1911, and later the plant was moved to Cleveland. In 1919 he sold his interest in the Torbensen plant and organized the Eaton Axle Co., which built a new modern type plant which in 1920 was merged with the Standard Parts Co. Late in that year when the affairs of the Standard Parts Co. resulted in the receivership, Mr. Eaton was made one of the receivers, but later resigned and in 1921 bought back control of the Torbensen axle plant. Details of the financing of the new company have not yet been announced but it is stated that the financing will be handled by a large banking syndicate.

C. L. Ochs, general manager Eaton Axle Co., will be vice-president and general manager of the axle division. D. C. Swander, general manager of the Perfection Spring plant, will be vice-president as well as general manager of the spring division, and R. C. Enos, general manager of the Torbensen company will be vice-president and director of sales of the entire company. F. A. Buchda, secretary and treasurer of the Torbensen company will be treasurer, and H. C. Steusy and H. G. Knerr will be controllers of the axle and spring divisions respectively. P. T. Hill of the Eaton company will have charge of sales of the axle division. G. W. Carlson, chief engineer of the Torbensen company will be chief engineer of the axle division, and E. V. Elconin, chief engineer of the Eaton company, will be assistant chief engineer. B. H. Blair will continue as chief engineer and W. H. Wallace as sales manager of the spring division. M. W. Wimmer will be in charge of operations at the Perfection plant. B. A. Litchfield will continue to operate the Pontiac plant. H. E. Weymouth and George Smith will be works managers at the Eaton and Torbensen plants respectively. The Eaton Axle & Spring Co. is offering to a syndicate of bankers 140,000 shares of no par value common stock which will be used to complete acquisition of the Standard Parts properties and for additional working capital. This stock is offered at $30 per share. Under the plan the capital stock of the Torbensen Axle Co. will be increased from 80,000 to 220,000 shares.

Another plant of the Standard Parts Co., the American axle plant, Cleveland, has been sold by the receiver to J. R. Raible, president of Greif Bros. Cooperage Co., for $150,000. With the sale of this plant and the Eaton axle plant, the receiver has realized $2,347,000 from the sale of plants of the Standard Parts Co. and still has unsold the Standard welding plant in Cleveland and the Hess spring plant in Cincinnati.

The Galvin-Gilmour Body Corporation, Detroit, whose plant was badly damaged by fire a week ago, has announced that it will rebuild at once.

German Market Activity Much Less

General Trade Depression and Adequate Supplies of Pig Iron and Steel Halt Imports—Iron Prices Rise—Ruhr Operations Decline Heavily

(By Radiogram)

BERLIN, GERMANY, April 30.—The market for heavy goods is inactive, owing to general trade depression. The supply of pig iron and steel in the unoccupied provinces is more than sufficient for immediate requirements and import orders are declining. Exports practically have ceased.

New declines in the mark already have affected prices. Foundry iron No. 1 has been raised to 660,500 m. per metric ton ($23.48 per gross ton, at 3.5c. per 1000 m.), compared with 616,300 m. ($29.74 at 4.75c.) prevailing since April 9.

Increases in prices of the Steel Syndicate are impending. For the moment the prices established April 16 prevail, but the change in rate of exchange affects their dollar equivalent, as follows: Steel ingots are 728,000 m. ($25.88, in place of $35.13); bars are 1,012,000 m. (1.61c. per lb., in place of 2.18c.); thin steel sheets are 1,596,000 m. (2.53c. per lb., in place of 3.44c.).

Smelting and rolling activity in the Ruhr district is now falling rapidly, the cause being a complete lack of a market.

New big fusions are proceeding, the first being the union of the Linke-Hoffmann engineering group with the Upper Silesian (Caro-Hegenscheidt) concern, by which the former organization is assured of a supply of pig iron.

Unemployment and Part Time Increase—Unoccupied Area Buys Abroad—Prices Decline —More Mergers

BERLIN, GERMANY, April 10.—Unemployment and short time work are generally increasing. In agricultural districts the demand for farm laborers somewhat relieves the situation, but in the towns and the industrial districts there is a greater decrease in employment, and the metal industry is largely affected. The trade unions report an increasing number of unemployed; 319,117 in March against 252,873 at the end of February. This constitutes, with 5.7 per cent in March against 4.4 per cent in February, the highest number since 1919. The number of unemployed is increasing more slowly now, which is to some extent a result of seasonal work, although building activity has not been as great as was expected. According to reports from different towns, the number receiving unemployment benefits, which had increased by 15 per cent during the second half of February, had further increased by 12 per cent in the middle of March. In some towns the authorities and the tramway companies are reducing their staff, which is also adding to the number of unemployed. There are comparatively few disputes about wages at present, although the official index of the cost of living during March again increased by 8 per cent to 2854 times the pre-war level.

In the Ruhr, a few smelters and rolling mills, which were closed because of coal shortage before the occupation, have been reopened as a result of the abundance of coal. In general, Ruhr iron and steel production has declined but so far no labor has been discharged. Nearly all the companies continue to employ their men on repairs, improvements and extensions. In unoccupied territory there is no shortage of coal, iron or steel and the pig iron market is, even after a period of great activity, dull because of the abundance of material. Consequently the iron consuming industries are not suffering from shortage of raw materials, but some branches, particularly the cutlery, hardware and small iron ware manufacturers of Solingen, Hagen and Remscheid complain that buying has ceased and that export orders are not at all large.

In the Ruhr the chief problem continues to be that of credit in order to enable works to pay their men. Many big works as a result of the stoppage of exports and of shipment into the unoccupied provinces are practically without income. The State has so far provided money by inflation. The condition of Ruhr industry is precisely the same as the condition of the Federal Finance Ministry; both have enormous current deficits in the balance of outlay and receipts, and these deficits are successfully covered by creation of artificial credit and cash. How long the process will continue is doubtful; but extreme pessimism is counteracted by the failure of earlier predictions of a general German crash.

Unoccupied Germany is still buying iron and steel from abroad. British pig iron, although a little dearer than the normal German price is cheaper than German pig iron produced with British coal, for which a supplement is added to the Iron Industry Union's ordinary rates. Hungary late last month made her first delivery of pig at a price, paid in sterling, of £11 per metric ton. The Stinnes-owned Austrian Alpine Montangesellschaft reports orders for several months in advance, partly for delivery to Germany and partly for countries from which German competition has been eliminated. Austria is also receiving orders for locomotives and machines. German orders for steel rails have gone to the Alpine and the Graz Rolling Mill companies. The journal *Stahl und Eisen* gives a relatively optimistic picture of conditions; but the last monthly report of the Prussian Ministry of Trade is less confident and declares that the disorganization of railroad and river communications has wrought much havoc and fear is expressed at the possibility of exporting the large stocks of steel now accumulating in the Ruhr when the present embargo is raised. Industrial leaders declare that any further mark recovery would make export impossible and the Reichs Wirtschaftsrat has recommended reduction of the export duties. The locomotive and machinery builders complain of slackening orders and part of the Berlin metal works has reduced operations to a 24-hr. week. Electric equipment manufacturers make the same complaint, but most of them have sufficient old orders to maintain undiminished production for several months.

Price Reductions Follow Cuts in Coal

Following the reduction in the net coal prices by about 3000 marks per ton, and in the coal tax from 40 to 30 per cent which amounts to a total decrease of about 16.5 per cent of the ultimate price, several other trade associations are readjusting their prices to a lower scale. The general reverse in business is also forcing them to adopt this course. The iron foundries announce a reduction of 10 per cent plus 100 marks per kg. for engineering castings, and 14 per cent for commercial castings. The general downward movement of prices is also aided by the reduction in iron and steel prices, which was decided upon at the last meeting of the Pig Iron Association. Hematite is cheaper now by 32,000 m, (4.7 per cent), Siegerland steelmaking iron by 53,000 m. (5.9 per cent) and spiegeleisen by 64,000 m. (6.4 per cent) per metric ton.

The new works guiding prices are as follows in marks per metric ton:

Hematite	646,300
Foundry iron No. 1	616,300
Foundry iron No. 3	613,300
Foundry iron, Luxemburg	603,300
Steel making iron poor in copper	646,300
Siegerland steel making iron	843,700
Spiegeleisen 8-10 per cent	939,600

Prices for material blown in with the imported (British) coal have also been reduced. Hematite has dropped from 785,000 to 770,000 m., foundry iron No. 1 from 755,000 to 740,000, and foundry iron No. 3 from 752,000 to 737,000 m. per ton. It is reported that the association has decided to discontinue the sale of British hematite as the demand can easily be met with domestic material. Foreign material is, however, still cheaper than the domestic product. British hematite for instance is quoted delivered free, German seaport, at 138s., which, at the present exchange rate, is about 690,000 m., while the German works guiding price for material blown in with British fuel is still 770,000 m. per ton. Foundry iron is 140s., equal to about 700,000 m., and the German price is about 740,000 m. Pig iron, blown in with German fuel is, however, difficult to secure, and the price is therefore only nominal. Business in pig iron continues dull. New orders are scarce because of the decreasing activity of foundries. Complaints of non-delivery, which were frequent until a few weeks ago, have practically ceased.

The reductions in the price of industrial products are, however, only small, and manufacturers are generally not inclined to offer more favorable terms. The uncertainty of political developments, especially in the Ruhr is depressing business.

The following are the Steel syndicate prices set on April 11:

	Marks Per Metric Ton
Ingots	728,000
Blooms	813,000
Billets	864,000
Slabs	890,000
Bars	1,012,000
Wire Rods	1,080,000
Sheets:	
5 mm. and heavier	1,144,000
3 to 5 mm.	1,282,000
1 to 3 mm.	1,471,000
Less than 1 mm.	1,596,000

There is agitation for a reduction of railroad freights, but the Federal Railroad Council has proclaimed against any reduction. At present if losses on the Ruhr, which cannot be estimated, are left out of account, the Federal railroads are paying their way, and the aim of the refusal to cut rates is to prevent a return to the former system of subsidies from the Federal treasury.

The new ruling calling for inspection of shipping papers before the discharge of a cargo in the Ruhr district has brought the shipping of ore to works in the occupied area to a standstill. Because of the order of the German Government prohibiting this inspection, the works have claimed a cause of "force majeure" and cancelled their orders. Some companies, however, are storing supplies at Rotterdam or Emden. As considerable stocks have accumulated at factories, there will be no scarcity for some time.

The Friedenshütte works which belongs to the Upper Silesian Railway Supplies Co., has concluded a merger of joint interests with the Polish Engineering Works, which constitutes an important enlargement of the concern. The Polish interest has engineering and construction works, and foundries at Lemberg and Krakau and railroad rolling stock factories at Sanok and Ostrow.

There are also negotiations for a fusion between the Linke-Hoffmann works and the Upper Silesian Iron Industry Co. which belongs to the Caro-Hegenscheidt company. Linke-Hoffmann would in this way enlarge its basis for the supply of raw material and coal considerably. The various works of the Linke concern, Lauchhammer-Risa, and the Steelwork Henningsdorf, Berlin, where open-hearth and electrical steel, railroad wheels and axles, and other railroad and track supplies are manufactured, as well as the locomotive and car shops at Breslau, Köln, Brand, and the engineering works at Werdohl and Warmbrunn, have a large consumption of raw material.

EXPORT SALES DECLINE

China Inquires for Second-Hand Material—Cuba, Philippines and Other Sugar Markets Active

NEW YORK, May 1.—Export trade has been extremely quiet for the past week, although there is a fair continuation of the recent activity from Cuba, the Philippines and other sugar producing centers. South American markets also continue to buy moderately. Chinese buying is slack, largely as a result of prices now being quoted, which the Chinese believe are too high. Japan is still buying sulphate of ammonia on a slightly reduced scale and shows some activity in steel inquiries, but on the whole this market also is quiet. The Japanese export house which received the latest purchase of the Nippon Oil Co., 10,200 boxes of tin plate, has booked an additional 1000 boxes from another source. This apparently brings the total of Japanese tin plate buying in the past few weeks to about 47,700 boxes distributed among three Japanese exporters: Mitsubishi Shoji Kaisha, 16,500 boxes; Mitsui & Co., about 20,000 boxes and Takata & Co., 11,200 boxes. In addition an order was placed by the Nippon Oil Co. with Suzuki & Co., which was filled from the company's warehouse stock in Japan.

About the only other business of any size recently placed seems to have been a total of about 100 miles of galvanized ground wire for transmission lines, awarded to a Japanese export house and some galvanized sheet business. Current inquiries are small. There is some demand for electrical sheets and an inquiry for several thousand tons of ship plates is reported current. The South Manchuria Railway Co., which with the exception of a tender on material for assembling 17 locomotives, has been inactive in buying for some time, has opened bids on 5000 splice bars for 80-lb. rails. There is also some inquiry for machinery and machine tools. One exporter is handling a small list of tools for a Japanese manufacturer of bicycle accessories, which include a screw cutter, bending and straightening machine and slotting machine.

China is buying quite consistently of second hand material, but is evincing less interest than usual in wire shorts, probably because of the high prices now being quoted for this material and the poor quality of many lots offered. A quotation of $60 per ton brings the price to about $72 per ton delivered to the Chinese merchant and the price that he can obtain for this material out of stock is limited.

Inquiry for Second Hand Ship Plates

On second hand material, however, one exporter to China is handling an inquiry for about 1000 tons of second hand ship plates, the chief obstacle evidently being the difficulty in securing such a tonnage of material of the condition and quality demanded by the Chinese. There is some interest shown in tin plate, but even resale material offered at lower than current prices is usually considered too high. There is also a light demand for galvanized sheets, but orders are generally small. China is considered by exporters to the Far East as a potential market for a not inconsiderable tonnage of rails, but price and the arrangement of credit are obstacles to any business at present. Despite this, one export house is negotiating with a Chinese railroad on 3000 tons of 45-lb. sections.

Foreign Construction Projects

Among recently announced construction projects, reported to the Bureau of Foreign and Domestic Commerce, is an announcement of the Ministry of Public Works at Bogota, Colombia, that the construction of an aqueduct at Buenavantura is contemplated, to insure a continual supply of water.

Bids have been invited by the Chilean Ports Commission for the construction of the port works of Constitucion. The complete works will be paid for by a concession, according to present plans. Specifications are available at the Chilean consulate in New York and also in foreign capitals. Bids are to be opened in Santiago, Chile, Dec. 27, 1923.

SAFETY CONFERENCE

Material Handling Problems and Dust and Fume Hazards Discussed at Chicago

There was an attendance of 219 at the Mid-Year Safety Conference which was held at Chicago on April 17, under the auspices of the engineering section of the National Safety Council, the Chicago Safety Council and the Western Society of Engineers. George T. Fonda, Fonda-Tolsted, Inc., Washington, chairman of the engineering section, presided at the morning session, which was devoted to the discussion of handling material.

C. H. Smith, Continental Casualty Co., Chicago, enumerated the classes of accidents due to various causes and their severity, illustrating his talk with a number of charts. He emphasized the well-known fact that handling material by hand is the greatest individual cause of accidents and that injuries decrease proportionately as hand labor is replaced by machines.

Conveying machinery as a means of eliminating accidents was the subject of an illustrated address by H. L. McKinnon, C. O. Bartlett & Snow Co., Cleveland. He showed lantern slides of many of the more common types of conveyors, pointing out the safety features of each. To illustrate the value of mechanical conveyors in reducing accidents, he cited the example of one foundry. In 1907 the plant had one unit of conveying equipment and employed 1400 men. The records of the company showed that the medical department handled an average of 200 dressings a day. The foundry now operates four units of conveying equipment and has 1200 employees. The record to date for 1923 has been less than 40 dressings a day, and production has increased considerably.

W. G. Nelson, Economy Engineering Co., Chicago, discussed portable elevators in handling material, illustrating his remarks with a motion picture film which showed the old way of lifting and piling heavy containers by hand labor and the quicker and safer method of doing the work by means of portable elevators. He stated that portable elevators reduced the number of men required and eliminated many injuries.

Eliminating material handling accidents by the use of trucks was the subject discussed by D. L. Darnell of the Baker R. & L. Co., Cleveland. He pointed out that the ordinary wheel barrow, the simplest form of conveyor, is by no means a safe device. The man pushing a wheel barrow is slow and thoughtless, owing to the monotony and physical effort of his work. Often when the same man is instructed in the use of an electric truck, he becomes alert and interested.

Mr. Darnell showed several slides of different types of trucks now on the market and emphasized their value in preventing accidents and speeding up work. One feature of an electric truck shown aroused particular interest. To keep the truck in motion it is necessary for the operator to keep his foot on the pedal and when he removes his foot, the truck automatically comes to a stop. Some of those present objected to this feature on the ground that it differed in principle from the operation of an automobile, and anyone who drove a car would become confused in operating a truck. The general concensus of opinion, however, was that this method of stopping was the safest, inasmuch as the truck would come to a stop in case the operator should be jarred from his seat.

E. F. Blank, Buick Motor Co., Flint, Mich., led a brief discussion summing up the points brought up in the various talks. The most important factors in the prevention of accidents in handling material, he said, were education and supervision. It was essential, he said, that foremen make motion studies of different operations with the purpose of determining the safest way of doing certain tasks. He also emphasized the value of good housekeeping, which includes proper piling and leaving plenty of aisle space. In discussing monorail conveyors, Mr. Blank said that safety stops would eliminate most accidents, but that absolute safety could not be secured by keeping the men out from under the path of the conveyors, as that is frequently impossible in the plants where the floor space is limited.

At the afternoon session the general topic of dust and fume hazards was discussed from the standpoint of the danger of dust explosions, the effect of dust and fumes on the worker and the methods of removing dust and fumes. J. I. Banash, consulting engineer, Chicago, and member of the executive committee of the engineering section of the National Safety Council, presided.

A banquet held in the evening at the Morrison Hotel was attended by 550.

BRIDGEPORT WAGE SYSTEM

Plan by Which Employees Are Graded and Paid According to Fitness and Performance

Manufacturers of Bridgeport, Conn., have adopted a plan that is designed to exert a stabilizing influence on wages and to make adjustments by means of a scale taking into account ability and the character of the work. Through the Manufacturers' Association monthly reports of wages paid to some 240 classifications of labor are made to all members of the association.

Bridgeport is working a 50-hr. week and has the open shop. The manufacturers do not favor a union scale, but want divergence, the pay depending on the ability of the operator. The aim is to have the best men receive higher wages than would be possible under a union scale. Further, as a part of this system, a man can connect with the class of work in which he is most efficient, thus being enabled to earn the highest rate according to his graded ability. It is natural that the bulk of the labor in the various classifications should receive the average wage paid for that work. Some workers have been given wages entirely out of line with the group average, some being paid too little and others too much.

In order to classify on the score of ability, the work is graded as to care, accuracy, and other requisites of proper performance, and is assigned according to the fitness of the men. For instance, under the classification of tool room crafts there are six sub-divisions. There are all around tool makers, die makers, gage makers, gage and fixture makers, jig and fixture makers, and ordinary tool makers. An effort is being made to standardize wages paid these various crafts—to raise those out of line on the low side and lower those out of line on the high side, unless the man on the lower scale could do better on a lower class of work and the man being paid the higher scale could be transferred profitably to work requiring a higher order of skill. In some cases average earnings in higher classifications were found to be lower than the starting rates for unskilled labor. This situation is under correction.

The purpose is eventually to work out a scale of wages which will give proper recognition to the worker's ability. The system informs each manufacturer as to the wages being paid for various classes of work and tends to keep employers from bidding against one another when there is a shortage of labor. Such a shortage exists at present in Bridgeport. In certain classes of work where women are employed in manufacturing, a thousand could find places awaiting them, with proper housing facilities built during the war.

Manufacturers are asked each month to give a complete report on the last complete months' wages paid. They are asked to eliminate learners, pensioners and those partly incapacitated. Where common labor is paid something over the average starting rate, in view of extra hazard or unusual exposure or other exceptional factors, these figures are excluded.

Patents, patterns and drawings of the rolling mill machinery of the Sundh Engineering & Machine Co., Philadelphia, have been acquired by the Blake & Johnson Co., Waterbury, Conn. Machines of the Sundh design will be added to the line of the Waterbury company.

CANADIAN INDUSTRIES

Iron and Steel Conditions Improving—Heavy Buying by Railroads

TORONTO, May 1.—The iron and steel industry of Canada is steadily gaining a stronger footing. Throughout the years 1921 and 1922 interests associated with the development of iron and steel and the products thereof had numerous adverse conditions with which to contend, which greatly curtailed their earning powers and in nearly all cases annual financial statements issued for these two years showed a big decrease in profits. At the beginning of 1923, the difficulties which had to be met during the former two years had almost entirely disappeared and business started to pick up. From the first of January until the present, market conditions have been improving and as a result steel mills, foundries, machinery and tool builders, and industrial concerns in general now report very satisfactory conditions; in fact, some Canadian steel plants are so far behind on some products that they are not carrying on an active campaign to secure additional business, but are sitting tight and giving the best delivery possible to their customers.

The placing of contracts by the Canadian Pacific Railway and the Canadian National Railways have been big factors in bringing about a revival of business in the Dominion. The Canadian National Railways, alone, has issued orders for a total of $20,250,000 worth of rolling stock, and of this amount all but $1,500,000 has gone to Canadian builders. In addition the company has placed extensive contracts for rails with mills at Sault Ste. Marie, Ont., and at Sydney, N. S. On its part the Canadian Pacific Railway is spending $7,663,100 on extensions and improvements of various kinds, is building 97 miles of new road, the cost of which has not been announced, and is purchasing equipment to the value of $12,300,000. Before the close of the year, it is likely that the expenditure of the Canadian Pacific and the Canadian National Railways will greatly exceed those already mentioned. Of great importance with regard to the heavy expenditure on the part of railways is the fact that many and varied industrial concerns share in the business. Orders for locomotives and cars mean that steel plants, lumber mills, rubber factories, paint factories, etc., will secure orders for component parts of the equipment to be constructed. Thus the orders already placed have started things moving in many lines of industry.

In the iron and steel market business has picked up considerably during the past few weeks and as a result the demand for practically all commodities is brisk. Many new commercial and industrial buildings are under construction throughout Eastern Canada, while at the same time announcements are continually being made regarding new building programs on a scale sufficiently large to keep the building trades of the Dominion active throughout the entire year.

A general falling off in demand is reported in the pig iron market. The chief reason for this is that melters have already covered for their second quarter requirements and the present demand is almost entirely for spot iron from melters who underestimated their needs for second quarter and from the smaller buyers who do not adhere to the policy of buying ahead. While shipments of pig iron into Canada from the United States have shown a falling off during the past few weeks, it is stated that Canadian furnaces are shipping limited tonnages into the American market. No British pig iron has been imported into Canada since last fall.

MICHIGAN MANUFACTURERS

Association at Annual Dinner Hears About Great Progress of the State

The Michigan Manufacturers' Association held its twenty-first annual dinner at a meeting at the Hotel Statler, Detroit, April 25, electing Clarence E. Bement, Lansing, vice-president and general manager of the Novo Engine Co., that city, to serve as president of the association for the ensuing year. Mr. Bement succeeds Arthur B. Williams, Battle Creek, who has been an officer and director of the association for 12 years. H. J. Mallery, of Flint, vice-president of the Buick Motor Co., was chosen first vice-president, and Arthur T. Waterfall, of Detroit, vice-president of Dodge Brothers, Inc., second vice-president. M. J. Murphy, Detroit, head of the Murphy Chair Co., was made treasurer. John L. Lovett, secretary and general manager, will be reappointed to both positions by the directors.

In his address, Retiring President Williams predicted that in the next 10 years Michigan will probably rank among the first four manufacturing States and called attention to the fact that since the founding of the association, in 1902, Michigan had changed from a purely agricultural State to the seventh manufacturing State in the Union. He expressed himself as concerned because the present Michigan corporation license tax law imposes a greater tax burden upon the corporations of this State than is borne by the manufacturers of any other State in the Union. He favored a revision downward in this statute with a reduction in the minimum rate. The speaker drew attention to the fact that the association had been instrumental in prevailing upon the State Legislature to decline to enact a law providing for a State income tax, which failure will save the manufacturers of the State from $12,000,000 to $15,000,000 annually.

The new directorate of the association is composed of the following:

Elected for three years: W. S. Rowe, president Valley City Milling Co., Grand Rapids; Arnold Boutell, secretary Saginaw Mfg. Co.; M. L. Pulcher, president Federal Motor Truck Co., Detroit; Oscar Smith, president Parke, Davis & Co., Detroit; Robert W. Irwin, president Robert W. Irwin Co., Grand Rapids.

Elected for two years: Wendell L. Smith, A-B Stove Co., Battle Creek; W. H. Burnha, president Peerless Wire Fence Co., Adrian; W. E. Curry, general manager Cobbs & Mitchell, Cadillac; Sydney McLouth, manager Vessels & Shipbuilding, Marine City; P. W. A. Fitzsimmons, president H. Brewer & Co., Tecumseh.

Elected for one year: L. F. Bomhoff, Jaxon Steel Products Co., Jackson, Fred Westover, president Westover-Kamm Co., Bay City; A. M. Larsen, president Kelly Valve Co., Muskegon; S. W. Utley, vice-president and general manager Detroit Steel Casting Co., Detroit; George P. Wigginton, president and general manager Kalamazoo Loose Leaf Binder Co., Kalamazoo.

Refractories Statistics for March

Clay fire and silica brick statistics for March as compiled by the Refractories Manufacturers' Association, figures in parenthesis being percentage to monthly economical producing capacity of those reporting, in 9-in. equivalents, follow:

	March	February
Clay Fire Brick		
Capacity reporting	75,827,561	75,681,728
Stock, first of month	157,430,075 (206)	154,567,117 (204)
Production	64,110,439 (84)	53,979,724 (71)
Shipments	68,061,572 (89)	51,312,666 (68)
Stock, end of month	153,478,942 (201)	157,234,175 (208)
New orders	96,168,442 (126)	65,074,708 (86)
Cancellations	388,752 (1)	453,276 (1)
Net new business	95,779,690 (125)	64,621,432 (85)
Unfilled orders	114,078,654 (149)	85,391,936 (110)
Silica Brick		
Capacity reporting	24,172,167	24,172,167
Stock, first of month	40,281,980 (166)	41,172,739 (166)
Production	14,854,159 (61)	12,872,103 (53)
Shipments	15,748,630 (65)	12,762,862 (53)
Stock, end of month	39,387,509 (163)	40,281,980 (166)
New orders	32,361,554 (134)	19,660,371 (81)
Cancellations	132,401 (1)	66,186
New business	32,229,153 (133)	19,594,185 (81)
Unfilled orders	47,428,251 (196)	30,947,728 (128)

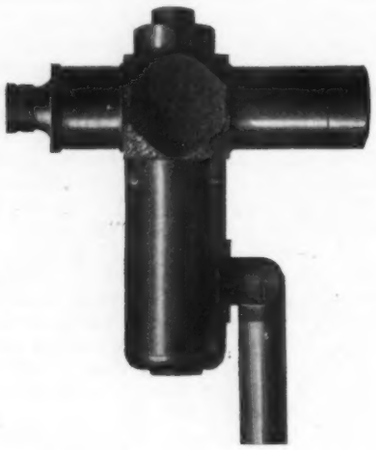
The American Rolling Mills, Inc., 54-56 Oakland Street, Trenton, N. J., recently formed under State laws with capital of $125,000, is negotiating for a local site for the construction of a new rolling mill. The new company is headed by Henry F. Ketterer, Harry M. Episcopo and Andrew M. Cella. The last noted is representative.

A NEW RADIATION PYROMETER

Portable Instrument for the Measurement of High Temperatures

BY D. FLIR

As all thermoelements must be protected at high temperatures against the chemical influence of their surrounding mediums, and the life of the rare metal couple is in many cases unsatisfactory, while the protection tubes introduce a considerable time lag in the measurement, optical or radiation means of determining temperatures are important. A new radiation pyrometer called ardometer has been employed with much success, especially in European countries. Its name, derived from the Latin, means "heat meter." The instrument weighs one pound; it is only 5 in. high and 5 in. long.



General View of Instrument, Which Is 5 In. High and 5 In. Long

As shown in the diagram, the ardometer consists of a telescope, with objective and ocular lens, between which is located a small thermoelement in a sealed glass bulb. The hot junction of this thermoelement is soldered to a thin, blackened platinum disk; the free ends of the couple being connected to a galvanometer,

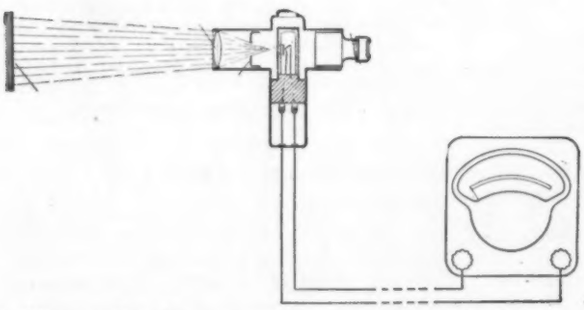
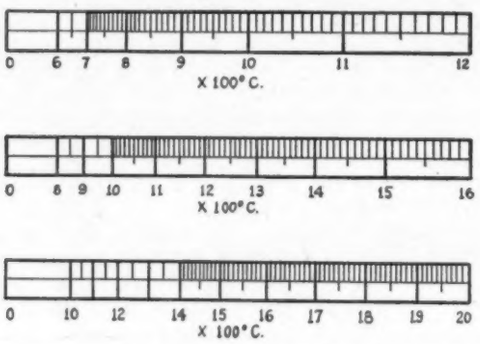


Diagram Showing Arrangement of Parts and Method of Operation

either indicating or recording. In spite of its lightness this is a rugged instrument and the sensitive couple is protected against dust and dirt. The objective lens can be readily cleaned when dusty.

When in use, the instrument is sighted directly on the incandescent body. The total radiation of a definite area of the body is concentrated upon the blackened disk by the objective lens. In this manner the hot junction of the small couple is heated and the generated emf. (electromotive force) sends through the circuit a current which causes a deflection of the galvanometer pointer. The phenomenon is governed as in other radiation pyrometers by "Stefan-Boltzmann's" law, which states that the received thermal energy is proportional to the fourth power of the absolute temperature of the incandescent body, provided the temperature of the receiving body is low compared to that of the incandescent body. Since the galvanometer deflection will be proportional to the fourth power of the absolute temperature, also, the galvanometer will have widely separated divisions at the upper section of the scale. Though the objective lens absorbs a part of the heat rays, this is without influence on the correct reading, since the instrument is always calibrated with its lens in position. Standard scales reading up to 2200, 2600, 3000, 3300, 3700, 4000 and 4600 deg. Fahr. are available. Smaller ranges than 2200 deg. maximum are not available, because the generated emf. would be too small.

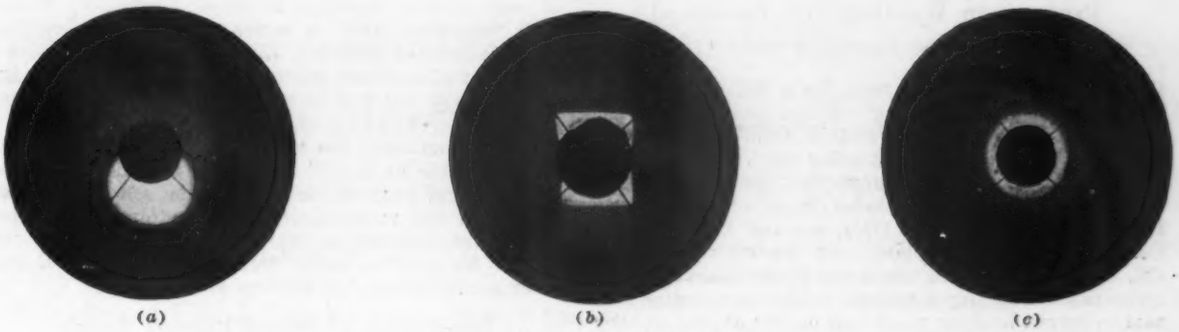
It is necessary to select carefully a range in which the maximum temperature does not greatly exceed the temperatures the instrument is to be used at, for at low temperatures the deflection of the pointer is small and the reading appears in a less favorable part of the scale where the indications are less accurate. To adjust each instrument for any range, a diaphragm is provided just behind the objective lens. All ardometers calibrated for the same range are interchangeable, because they generate the same emf. at equal temperatures. Therefore one indicator with a selective switch or a multiple recorder can be used for several instruments. One galvanometer can also be calibrated for two different ranges, for use with several ardometers.



Typical Scales for Use Over Varying Temperature Ranges

The platinum disk and the wires of the thermocouple being very thin, the instrument has practically no heat inertia and follows each fluctuation in temperature of the glowing body instantly, giving correct readings only a few seconds after focusing. The gen-

Instrument Housed in a Tube Protecting It from Mechanical Injury



(*a*) (*b*) (*c*)

Illustrating Proper Focus (at *c*) and Improper (at *a* and *b*)

erated emf. being comparatively high, enables the application of reliable galvanometers of the double pivoted type.

In operation, the radiation receiver can be permanently installed or used as a portable instrument. After being properly connected to the indicator or recorder it has only to be sighted on the glowing object so that the black platinum disk as seen through the ocular lens is perfectly covered and surrounded by radiation, as shown at *c*. The red glass accompanying each instrument may be used to protect the eye from excessive radiation during focusing. Figs. *a* and *b* illustrate faulty focusing; in *a* the glowing area of the body being eccentric to the optical axes of the ardometer, while in *b* the area is too small at the given distance to cover the disk with radiation.

When the distance between the sighted object and the instrument is 3 ft., the glowing area must possess a diameter of at least 2.6 in., while at other distances the glowing area must be proportionally larger or smaller. The distance from the glowing body, if within proper scope of practical application, does not influence the readings, so long as the black disk is covered and surrounded by a field of light, as at *c*. This is true because, while the emitted radiation decreases as the square of the distance, the sighted area increases as the square of the distance and the two influences cancel each other. The absorbing influences of smoky and dusty intervening atmosphere would of course increase with the distance.

Either a pedestal or a tripod may be used for mounting the instrument, or it may be fixed to a shelf or other holder. It is manufactured by Siemens and Halske, Berlin, Germany, and is distributed in the United States by the Bacharach Industrial Instrument Co., Pittsburgh.

SUITABILITY OF WELDING STEELS

Within Limits, Chemical Character Has Little Bearing—Importance of Having Clean Steel

At a meeting of the steel committee of the American Welding Society, held April 26 in the Engineering Societies Building, New York, under the chairmanship of W. J. Beck, a progress report covering the operations of the past year was gone over briefly by the secretary, W. Spraragen, and considerable discussion followed covering experiences of members of the committee and visitors. It was pointed out that the investigations of this committee constitute "an effort to expand the bounds of human knowledge."

Numerous fusion tests have been made to determine the suitability of various steels for welding and certain specifications have been drawn up from time to time. Unfortunately, steel manufacturers generally are not willing to make the special steels called for by these specifications, particularly as the quantities involved are small. Hence, the method of trial and error in eliminating various analyses has not progressed rapidly. Furthermore, changes in the chemical analysis of a steel frequently affect other qualities, as the tensile strength, ductility, etc. It was the opinion of some of those who discussed the matter that weldability of steel depends very little on variation in the chemical composition of that steel, but greatly on the "quality" of the steel. While this quality was not defined, it was the general understanding that it referred largely to the cleanness of the steel—its freedom from non-metallic material in the nature of slag and dirt.

Tire steel containing approximately 1 per cent carbon cannot be welded. Connecting rods containing about 0.50 per cent carbon can be welded, although this carbon content represents about the limit of weldability. Boiler steel of about 0.20 to 0.25 per cent carbon welds excellently and has been so welded for the past quarter century. A representative of the Baldwin Locomotive Works stated that over this whole period no case of failure of the weld had occurred in locomotive boilers, except where a boiler explosion took place, due to loss of water over the crown sheet. In these cases, of course, it was the weld which gave, as a welded joint like a riveted joint is the weakest portion of the circumference.

The question of the evolution of nascent hydrogen, due to pickling of steel, was brought up. It was stated that this penetrates the steel to some appreciable distance and that, upon heating the steel locally, as occurs in welding, this occluded gas is expelled explosively. This condition can be avoided by heating the steel to 500 deg. Fahr. and thus driving off the gas before attempting to weld. In the great majority of cases, however, steel is not pickled before being welded, but the scale is removed by sand blasting.

Non-metallic impurities in the steel are a positive detriment to welding, and it has been found that there is a clear relationship between prevalence of non-metallic impurities and defects in welds. Segregations of silicon and of silica also give trouble. Another source of trouble consists in laminations in plates, as the cause which produces the laminations prevents the welding together of the surfaces thus split apart.

Special open-hearth steel is specified and paid for for such uses as headers for boilers, where the larger diameter pipe is welded usually by the oxy-acetylene process. Steel with a carbon not more than 0.15 to 0.18 per cent was stated to weld better than with a carbon as high as 0.25 per cent. It was brought out that the Pullman Co. has extended its use of steel of under 0.12 per cent carbon from the making of passenger and other railroad coaches to the making of bodies for Packard automobiles. These sheets are relatively thin and are said to weld beautifully.

Five variables affecting weldability were finally chosen by the committee as subjects for further consideration. These include non-metallic materials in the steel, laminations, segregation of silicon, percentage of carbon and the element of thickness of the plate or sheet. These subjects were assigned to various members of the committee for report, while another report upon "What makes quality in steel" was called for from the representative of a steel manufacturer.

A new stainless steel rule designated as the No. 350 has been placed on the market by the Brown & Sharpe Mfg. Co., Providence. The rule will not rust, stain nor discolor. It is hardened and ground and graduations are in 8ths, 16ths, 32nds and 64ths.

Progress in Welding Arts Reviewed

(*Concluded from page* 1261)

Co., which has been in service for a year. There are three intermediate pumping stations and the line has been welded into a continuous tube from one station to the other, no coupling joints being used. The line carries 750 lb. maximum oil pressure. Successful steam line installations cited included those of the Warren Iron & Steel Co., Warren, Ohio, and the American Can Company's Cincinnati plant. At the Whitin Machine Co., Whitinville, Mass., where the power plant is being reconstructed, an oxy-acetylene welded installation was said to permit hooking up of new boilers as fast as they could be installed in place of those which were being removed. In the investigations of the welding of pipe, said Mr. Carter, it has been found that in every place where successful welding has been done a great deal of attention has been paid to the selection of welders and the testing of the finished work. The welding of two 1000-bbl. oil-storage tanks and method of test were outlined.

The welding of the barrels of concrete mixing machines in place of the usual riveted construction was suggested. The further extension of oxy-acetylene welding to maintenance and repair work was outlined. A study of this field was said to reveal lack of knowledge as to the correct methods of handling cast iron welding, and in this connection Mr. Carter said: "When plants have been instructed to pre-heat work properly and follow the operation with annealing, the results have been practically 100 per cent." Increased use of oxy-acetylene cutting was reported and many valuable applications of this process in cutting cast iron were said to have been made during the year.

Developments in resistance welding were outlined by H. Lemp, General Electric Co., Erie, Pa., who said that the progress made has been in extending the application of the process with existing apparatus. The successful welding of the halves of steel castings and forgings, the welding of cast iron valve heads to steel shanks and the successful welding of tungsten and copper cable for radio apparatus were mentioned among the newer applications.

J. H. Deppeler, chief engineer, Metal & Thermit Corporation, in taking up new developments in the field of thermit welding, briefly outlined the results of a research to eliminate blow holes in the steel, which is accomplished by permitting the gases to escape through the molds. Developments in the rail welding field and a new and more efficient design of pre-heater recently developed were described. Improvement of thermit steels themselves with a view to securing greater tensile strength and ductility and study of the thermit welding of manganese steel are being made.

Training Course for Welders

Throughout the meeting the necessity for proper training of welders was brought out as the fundamental of successful welding. A training course for oxy-acetylene welders which has been prepared by the committee on training of welding operators of the American Bureau of Welding, was explained at the technical session by J. C. Wright, Federal Board of Vocational Training, Washington, chairman of the committee. In this report an analysis of the work of an oxy-acetylene or gas welder is given. The analysis presents various type jobs with a statement of the operations necessary to perform each job, and the information and skill which the operator must possess in order to be an efficient worker.

The work of the gas welder has been classified into six blocks or major groups and an additional block based upon exercise jobs is included as a preliminary step. The classification of type jobs is arranged as follows: Preliminary practice work, welding cast iron; cutting; welding steel and wrought iron; welding aluminum; welding malleable iron; and welding copper and its alloys. Within each of these blocks a number of typical jobs have been listed and arranged in a series of "checking levels," which are convenient points at which the progress of the pupil is measured from the standpoint of some definite objective to be accomplished. Within each "checking level" a series of type jobs are provided in order of difficulty. The analysis also includes a statement of auxiliary information such as a knowledge of stock, the use and care of tools, safety precautions and others.

Charts outlining the course are intended for use by the instructor as a guide in laying out the course for training, and from which jobs may be selected and arranged in the most effective instructional order, for giving the instruction which will best prepare the worker for a given field. Basic, physical, mental and other qualifications for welders are given.

Investigation of Welded Pressure Vessels

The method and results of tests made by the Bureau of Standards on unfired pressure vessels, conducted in cooperation with the pressure vessel committee of the American Bureau of Welding, were outlined at the technical session by Dr. H. L. Whittemore, Bureau of Standards, Washington, chairman of the committee. Lantern slides were used to illustrate his talk and the many questions asked reflected considerable interest.

Of the events leading up to the investigation it may be mentioned that one of the important problems of the boiler code committee of the American Society of Mechanical Engineers in its effort to draw up satisfactory codes governing the construction of unfired pressure vessels is welding. Rules applicable to riveted constructions do not always apply to fabrication by welding. The problem is complicated because of the meagerness of scientific data upon which to base proper requirements for safety without placing unjust restrictions on the use of welding.

A hydrostatic and hammer test was finally proposed for determining whether a vessel was safe for the purpose designed. The American Bureau of Welding organized a committee to cooperate with the boiler code committee in determining the adequacy of the test proposed. Eight manufacturers placed at the disposal of the committee 40 tanks and enough funds. These tanks have been tested to destruction by the Bureau of Standards. The shells of most of the tanks were 6 ft. long by 2 ft. in diameter, and made of ⅜-in. mild steel plate. Both electric and oxy-acetylene welding were used. The hydrostatic hammer test developed that the welded pressure vessel, according to the regular formula for working pressure, has a factor of safety of about 6.

The results of the tests are now in the hands of the boiler code committee. Among other recommendations it was proposed that the steel plate used for class A and B vessels shall not exceed ⅝ in. in thickness, shall be made by the open-hearth process and shall be of good weldable quality and free from defects that would impair its quality. The chemical composition recommended is as follows: Carbon, not over 0.15, manganese 0.30 to 0.60, phosphorus not over 0.04 and sulphur not over 0.05 per cent.

In regard to the method of welding it was recommended that longitudinal seams shall be of the 90 deg. double-V type. Girth and head seams may be of the 90 deg. single-V type. Double V welds shall be reinforced to a total thickness of at least 1½ times the plate thickness at the center of the weld. Single V welds need not be reinforced more than 20 per cent of the plate thickness at the center of the weld.

Retaining the hydrostatic hammer test as in the code was recommended. To this is added: "After this test the pressure shall be raised to three times the working pressure and held there 3 min. except in the case of vessels of special construction, such as shell and tube brine coolers, condensers, inter-coolers, etc., in which case the pressure shall be raised to two times the working pressure."

The Wayne Iron Corporation is erecting a 500-ton ore concentrating plant, to cost $40,000, for the development of its iron ore deposits in Wayne County, Missouri. The company expects to start operations about July 1, at the rate of 200 tons per day.

Machinery Markets and News of the Works

LARGE RAILROAD BUYING

Wabash and Illinois Central Place Orders for Shop Tools

Heavy Purchases in Last Week Bring April Business Up to Level of March, Dealers Report

The Wabash and Illinois Central railroads were large buyers of machine-tool equipment last week. The Wabash placed orders at St. Louis for upward of 50 machines and the Illinois Central completed a buying program at Chicago. Its purchases last week amounted to about $125,000 which, added to tools bought by this road a month ago, make a total of $300,000. The extensive pending lists of the Santa Fe, Chicago & North Western and Elgin, Joliet & Eastern, which have been noted in THE IRON AGE, promise good business during the coming weeks. The New York Central bought about 10 engine lathes.

Next to the railroads the automobile companies are the most prominent buyers, although all classes of industrial companies are buying some equipment. The Ford Motor Co., Detroit, which has been a steady buyer for some time, is still adding to its equipment. The Oakland Motor Car Co. has bought 12 turret lathes and another automobile company has bought 21 lathes.

Other business worth noting includes an order for 12 Pratt & Whitney automatics placed by the Standard Tool Co., Cleveland. The Youngstown Sheet & Tube Co., Youngstown, Ohio, is inquiring for 8 or 10 tools.

There is an unusually heavy demand for cranes, indicating that expansion in industrial plants is being planned to take care of rapidly increasing business.

New York

NEW YORK, May 1.

WHILE there is a good deal of complaint that business in new machine tools has dropped off within the past two or three weeks, the demand for used tools keeps up at a fairly high rate. The fact is there are so many used tools in good condition on the market available for prompt delivery at prices 20 per cent or more below the prices of new tools that buyers are giving preference in many instances to used machines. In the demand for used tools specifications run largely to the heavier machines. A local machinery house has recently sold two 48-in., one 60-in., one 78-in. and one 125-in. lathes, one 72-in. planer and a 60,000 lb. steam hammer.

Buying within the past week has been confined mostly to single tools. Railroad demand predominates. Eastern machine-tool builders have received scattered orders from all over the country for railroad tools within the past week. The New York Central bought about 10 engine lathes. The Wabash bought a car-wheel borer. The Escanaba & Lake Superior purchased a 1500-lb. hammer. The St. Louis-San Francisco bought a 600-ton driving-wheel press and a locomotive journal turning lathe. The Manchester, N. H., street railways bought a car-wheel borer, and the Chicago & Great Western also bought a car-wheel borer. The A. O. Smith Corporation, Milwaukee, has ordered a set of straightening rolls. The Magnus Co., New York, has purchased two car-box borers.

The Manhattan Machinery Exchange, 30 Church Street, New York, has purchased the Barren Island garbage disposal plant, New York, and will offer for sale in parcels the equipment contained in the plant, including steel tanks, boilers, engines, hydraulic presses, motors and dynamic pumps, hydraulic pumps, air compressors, blowers, etc.

The Otis Elevator Co., Eleventh Avenue and Twenty-sixth Street, New York, has awarded contract to John T. Kelly, Yonkers, N. Y., for a one-story addition, 100 x 120 ft., to its plant at Yonkers, to cost $150,000 with equipment. Plans are under consideration for extensions to other works of the company. W. D. Baldwin is chairman.

The A. & G. Pierce Co., 103 Park Avenue, New York, fireproofing products, will build a one-story machine shop at 528-32 West Twenty-fourth Street.

The Victor Machinery Exchange, 253 Centre Street, New York, has inquiries out for two power presses, Bliss or similar type.

The American Smelting & Refining Co., 120 Broadway, New York, plans the installation of electrical and other mining equipment at its Rosita coal mine, to provide a capacity of 50,000 tons per month. A new copper and zinc plant, with electric power house, is also being considered on a site in Mexico. A portion of a $10,000,000 bond issue now being sold will be used for the expansion.

Bids will soon be asked by the National Biscuit Co., 85 Ninth Avenue, New York, for the erection of a two-story mechanical shop at 407 West Sixteenth Street, estimated to cost $175,000 including equipment. James R. Torrance is company architect.

The Manifold Supplies Co., 188 Third Avenue, Brooklyn, has commissioned Lockwood, Greene & Co., 101 Park Avenue, New York, engineers, to prepare plans for a four-story addition, 60 x 100 ft., to cost in excess of $100,000 with equipment.

The Brockway Motor Truck Co., 237 West Sixty-first Street, New York, has plans for a one-story addition to its factory on Broadway, Albany, N. Y., to cost about $25,000.

The Federal Equipment & Supply Co., 110 West Fortieth Street, New York, is making inquiries for a hacksaw machine, Peerless type.

The Buckingham Steel Co., 5714 Second Avenue, Brooklyn, will build a two-story shop addition, 100 x 124 ft., at 5708-20 Second Avenue, to cost about $27,000.

The Tottenville Copper Co., Bethel Avenue and Arthur Kill Road, Tottenville, S. I., has authorized plans for rebuilding the portion of its plant destroyed by fire April 22, with loss approximating $1,000,000, with machinery. Benjamin Lowenstein is president.

The State Hospital Commission, Capitol Building, Albany, N. Y., will receive bids until May 16 for refrigeratng equpment for the Manhattan State Hospital, Ward's Island, N. Y.; also for an electric freight elevator. Sullivan W. Jones, Capitol, is state architect.

The Verplex Art Co., Inc., 461 Eighth Avenue, New York, plans for the installation of a hydraulic press, about 350 tons capacity.

Emil Hald, 84 Oak Street, Brooklyn, has organized the Hald Blow Pipe Works, Inc., with capital of $25,000, to take over and expand his present plant. Emil and E. B. Hald head the company.

The Harry Bernstein Cut Stone Co., Inc., 1419 Thirty-eighth Street, Brooklyn, will build a one-story shop, 185 x 200 ft., to cost $26,000, at 1539-59 Troy Avenue.

The M. K. Welding & Brazing Co., Bleecker Street, Utica, N. Y., will install a 400-lb. drop hammer at its forge shop.

The Crane Market

The market on electric overhead traveling cranes continues extremely active, with no diminution in the volume of inquiries as yet evident. A fair amount of business is reported by makers of hand power cranes and chain blocks. Locomotive crane inquiries are not quite as numerous lately as during the past month. Some of the larger orders on electric overhead cranes closed recently include the Brooklyn Edison Co., Brooklyn, N. Y.; the Phoenix Utility Co., New York; the Hunt-Spiller Mfg. Co., Boston, and a 110-ton, 64-ft. span overhead traveling crane purchased by the Edison Electric Illuminating Co., Boston. The Congoleum Co., Philadelphia, has closed on two 2½-ton, 26-ft. span overhead traveling cranes. The Lock-Joint Pipe Co., Ampere, N. J., has closed on its seventh locomotive crane with the American Hoist & Derrick Co. for a contract in Tulsa, Okla. A purchasing office has been established at Tulsa, from which future purchases will probably be made. The Government of Porto Rico, 17 Battery Place, New York, has asked for bids, which will be forwarded to the Porto Rico Irrigation Service, Porto Rico, P. I., on several 3 to 5 ton 2-drum electric hoists to carry 2000 ft. of ¾-in. cable. The General Electric Co., Schenectady, N. Y., has pending five cranes for Pittsfield, two 2-ton, one 10-ton, one 5-ton and a 1-ton, and the West Lynn., Mass., works will close shortly on its 20-ton crane, for which appropriation has been made. The Baldwin Locomotive Works is in the market for 12 large overhead cranes for its shops. The city of Milwaukee opens bids May 10, on a 25-ton electric crane for the Riverside Pumping Station. The Sewerage Commission, city of Milwaukee, opens bids May 4, on two 20-ton electric traveling cranes and three 10-ton traveling cranes with motor operated hoist and trolley and hand operated bridge. Original bids opened April 13 were rejected.

Among recent purchases are:

Brooklyn Edison Co., Brooklyn, a 35-ton, 17-ft. span and a 60-ton, 34-ft. span overhead traveling cranes from the Whiting Corporation;

Phoenix Utility Co., 61 Broadway, New York, a 60-ton and a 10-ton overhead traveling cranes for the Utah Power & Light Co. from the Whiting Corporation;

Hunt-Spiller Mfg. Co., Boston, Mass., seven 10-ton electric traveling cranes, 35-ft. to 95-ft. span, from the Whiting Corporation; also complete powdered coal equipment;

Standard Steel Works Co., Burnham, Pa., a 10-ton, 3-motor and a 20-ton, 4-motor, both 58-ft. span, overhead traveling cranes from the Milwaukee Electric Crane & Mfg. Co.;

Hood Rubber Co., Watertown, Mass., a 7½-ton, 22-ft. 6-in. span, 3-motor, overhead traveling crane from the Milwaukee Electric Crane & Mfg. Co.;

Zaldo & Martinez, 66 Beaver Street, New York, a 15-ton, 34-ft. span, hand power crane of the Reading Chain & Block Corporation, from Arthur Appleton, 29 Broadway, New York;

Edgar T. Ward's Sons Co., 394 Frelinghuysen Avenue, Newark, N. J., three 2½-ton, underhung transfer cranes for a new warehouse, from the Shepard Electric Crane & Hoist Co.;

Sanford-Riley Stoker Co., Detroit, Mich., a 5-ton, 55-ft. span, 3-motor overhead traveling crane for use in foundry, from the Northern Engineering Works;

American Metal Co., 61 Broadway, New York, a 1½-cu. yd. bucket handling crane for export to Cuba, from the Northern Engineering Works;

University of Michigan, Ann Arbor, Mich., an electric traveling crane, 2-motor, 22-ft. span for use in foundry, from the Northern Engineering Works;

Utah Copper Co., 25 Broad Street, New York, a 60-ton, 60-ft. span 4-motor, overhead traveling crane with 10-ton auxiliary, from the Northern Engineering Works;

General Electric Co., Schenectady, N. Y., a 10-ton, 53-ft. span, 3-motor, overhead traveling crane from the Northern Engineering Works;

Jones & Laughlin Steel Corporation Pittsburgh, a 40-ton, 67-ft. 7-in. span, 15-ton, 85-ft. span and a 10-ton trolley from the Alliance Machine Co.;

Central Steel Co., Massillon, Ohio, a 5-ton, 50-ft. span, double legged gantry crane from the Alliance Machine Co.;

National Tube Co., Pittsburgh, a 40-ton trolley from the Alliance Machine Co.;

Bethlehem Steel Co., Bethlehem, Pa., a 25-ton, 80-ft. 4-in. span, overhead traveling crane from the Alliance Machine Co.;

International Harvester Co., Chicago, a 150-ton, 40-ft. span low type stripper and a 5-ton, 70-ft. span soaking pit crane from the Alliance Machine Co.;

Southern Pacific Co., 120 Broadway, New York, three 25-ton locomotive cranes, one from the Browning Co., one from the McMyler Interstate Co. and one from the Industrial Works;

Brooklyn Edison Co., Brooklyn, N. Y., a 15-ton locomotive crane from the Ohio Locomotive Crane Co.;

Lock-Joint Pipe Co., Tulsa, Okla., a 25-ton locomotive crane from the American Hoist & Derrick Co.;

Booth & Flinn, Pittsburgh, a 10-ton crawl-tread locomotive crane from the Brown Hoisting Machinery Co.;

United States Rubber Co., New York, a 20-ton locomotive crane from the Browning Co.;

Kelly Island Lime & Transport Co., Sandusky, Ohio, a 30-ton locomotive crane from the McMyler Interstate Co.;

Consolidated Electric Light & Power Co., Baltimore, Md., a used 20-ton Link-Belt locomotive crane from the York Chemical Works, York, Pa.;

Pierce, Butler & Pierce, New York, have purchased a No. 9½ cupola for Zanesville, Ohio, from the Whiting Corporation;

Utica Heater Co., Utica, N. Y., has bought a No. 10 cupola from the Whiting Corporation;

Crucible Steel Co. of America, 10-ton trolley for its Crescent Works, Pittsburgh, from the Shaw Electric Crane Co.;

Pittsburgh Plate Glass Co., Pittsburgh, Pa., for its Ford City, Pa., plant, a 10-ton 72-ft. 2-in. two cage crane from the Alliance Machine Co.;

Mosler Safe Co., Hamilton, Ohio, 5-ton crane from the Bedford Foundry & Machine Co.;

West Leechburg Steel Co., Pittsburgh, 5-ton floor controlled crane from Euclid Crane & Hoist Co.

The Hopewell Business League, Hopewell, N. J., Joseph M. Shuck, secretary, is interested in a project to establish a plant to manufacture a patented folding box, to cost approximately $50,000 with machinery.

Thomas Coleman, 9 Ferdon Street, Newark, is in the market for a large band saw.

The Edgar T. Ward Sons' Co., 394 Frelinghuysen Avenue, Newark, iron and steel products, will commence the erection of an addition, 36 x 100 ft., to cost $65,000.

The Art Metal Works, Inc., 7 Mulberry Street, Newark, Louis V. Aronson, president, has acquired the plant of the Riley-Klotz Mfg. Co., occupying adjoining property at 17-19 Mulberry Street, manufacturer of metal goods, at a receiver's sale for $60,000. It will be used for expansion.

Motors, controllers, conveying equipment and other mechanical apparatus will be installed in the new four-story printing plant to be erected at 219-21 Market Street, by the Newark *Evening News*, 215 Market Street, to cost in excess of $125,000. Henry D. Scudder, Jr., 9 Clinton Street, is architect.

The Public Service Electric Co., Public Service Terminal, Newark, will build an automatic electric station on Norfolk Street, with installation to include two 1500-kw. motor-generator sets, six 2000-kw. transformers, and auxiliary machinery.

Machinery Catalogs Wanted

WASHINGTON, May 1.—W. L. Schurz, American commercial attaché at Rio de Janeiro, Brazil, advises that he is desirous of receiving catalogs of machinery of all kinds that might be of interest in Brazil, it has been announced by the Industrial Machinery Division, Room 815, Department of Commerce. The catalogs should be mailed to the division, and marked on the outside front cover: "To be forwarded to W. L. Schurz, American commercial attaché, Rio de Janeiro, Brazil." Manufacturers who have agents in Brazil should indicate their names and addresses on the printed matter. It would be well to furnish more than one set of printed matter, as it is frequently desirable to have extra copies to give to interested inquirers. The language employed in Brazil is Portuguese; if printed matter is not available in that language, French would be preferable to Spanish.

New England

BOSTON, April 30.

THE machine tool market the past 10 days took on a semblance of returning activity. Business could be better with the smaller houses and with representatives of individual machinery makers. On the other hand, April, with the leading machine tool houses, was better than March, which was the best month experienced for a long time. The general character of sales since last reports, no large lists being involved, makes the aggregate all the more impressive. May opens with less important business booked than did April, yet practically every machine tool interest has a large number of quotations out and tools under active negotiation.

New England machine tool builders continue to secure good orders from outside sources. One of the largest recently is for 18 new type lathes by a Connecticut maker to the Ford company. Manufacturers' representatives continue to report delays in deliveries due to railroad embargoes, but the transportation situation is slowly clearing.

An inquiry for a small hand crane by a Massachusetts paper goods maker was the only development in the crane market the past week.

Carbon and high speed cutters have been advanced by the manufacturers. An advance of about 10 per cent in the Eclipse line of counterbores is forthcoming.

Sales the past week included a wide variety of tools from hack saws up to equipment costing well up into four figures or more. Stone & Webster, for the Edison Electric Illuminating Co., Weymouth, plant, purchased a small steam hammer, two lathes, a bolt cutter, two drill presses, a hack saw and a grinder. The Manchester Street Railway Co. bought a new 42 in. car wheel borer; a Lawrence, Mass., maker of paper machinery took a good sized punch and shear; a Maine maker of marine hardware purchased a double bolt cutter, a special production tool; a New Bedford company closed on a used milling machine, shaper and planer; while a Pawtucket, R. I., firm bought a new milling machine and four lathes. A used milling machine drill press and planer went to a local concern; universal and plain grinding equipment to Albany and Pennsylvania manufacturers; a small lathe with an extension gap to a Gardner, Mass., chair manufacturer; a tool room lathe to the Blanchard Machine Co., Cambridge, Mass. Sanders, adaptable for metal as well as for wood work, are in exceptionally good demand. A Massachusetts maker of machinery is reported as about to close on five tools to cost close to $20,000, and a Springfield concern on two or three turret tools as well as about $6,000 worth of other equipment. At the auction sale of equipment at the Metz Co., Waltham, Mass., plant, fairly good prices were paid for the most desirable tools.

A contract has been awarded by the Acme White Lead & Color Works, Border St., East Boston, for the rebuilding of its plant recently destroyed by fire. Lead machinery and other equipment is required.

A steel coal conveyor, 286 ft. long and 74 ft. high is to be erected by the Lowell Electric Light Co., Market Street, Lowell, Mass., as well as a one-story, 30 x 63 ft. power plant addition, contracts for which have been let.

Plans are under consideration by the Camden Yacht Building & Marine Railway, Inc., Camden, Me., for a machine shop. A new sawmill for the company is being completed, and new wood-working machinery is about to be installed.

The Connecticut Telephone & Electric Co., Meriden, Conn., manufacturer of radio instruments and electrical equipment, has acquired the former plant of the Wilcox & White Co., manufacturer of piano player mechanisms, and will use the property for extensions. Additional machinery will be installed in the power house. The company will hold in abeyance its proposed new plant, for which bids recently were taken.

The Fall River Steam & Gas Pipe Corporation, Sixth and Bedford Streets, Fall River, Mass., has plans for a four-story addition to cost about $65,000. E. I. Marvell, 57 North Main Street, is architect.

A manual training department will be installed in the proposed high school to be erected at Jay, Me., estimated to cost $100,000, for which an architect will soon be selected.

The Peck Spring Co., Broad Street, Plainville, Conn., has plans for a two-story and basement factory, 30 x 65 ft., estimated to cost $45,000, including equipment.

A vocational department will be installed in the new junior high school to be erected at Dorchester, Mass., by the Boston Board of Education, estimated to cost $500,000. O'Connell & Shaw, 18 Boylston Street, Boston, are architects.

The State Board of Education, Capitol Building, Hartford, Conn., plans the construction of a power plant at the Camp School, New Britain, Conn., operated in connection with the State normal school, estimated to cost $45,000.

The Portland Terminal Co., Portland, Me., a subsidiary of the Maine Central Railroad Co., has awarded contracts for the erection of a new locomotive and car repair works at South Portland. The structures will include an engine house, engine repair shop, car repair shops, machine shops, coaling station, power house and other buildings, to cost $1,500,000 with machinery. The erection will be handled by three contractors, J. J. Prindeville, Framingham, Mass.; the Gulliver Co., and F. A. Rumery Co., both of Portland.

The United Electric Co., West State Street, Springfield, Mass., is taking bids for a one-story meter service works, estimated to cost $65,000. H. L. Sprague, 310 Main Street, is architect.

The Board of Aldermen, Holyoke, Mass., plans the construction of a municipal electric power house and system to cost approximately $750,000.

The Dowd-Rogers Co., Carlton Street, Wallingford, Conn., manufacturer of plated metal ware, is having plans drawn for a one-story addition, 40 x 125 ft., to cost $45,000, with equipment.

The Montaup Electric Co., Fall River, Mass., has commissioned Stone & Webster, Inc., Boston, engineer, to prepare plans for a power plant on the local tide-water, estimated to cost $5,500,000 with transmission system. The first unit will have a capacity of 30,000 kw., and will be supplemented with another unit of like size at an early date. The station will have an ultimate output of 200,000 kw. The Montaup company is owned jointly by the Fall River Electric Light Co., Edison Electric Illuminating Co. of Brockton, Mass., and the Blackstone Valley Gas & Electric Co., Pawtucket, R. I.

Philadelphia

PHILADELPHIA, April 30.

FIFTEEN acres at Wissahickon and Abbotsford Avenues, Philadelphia, has been acquired by the Atwater Kent Mfg. Co., 4937 Stenton Avenue, manufacturer of wireless equipment, electric starting devices, etc., as a site for new works. Plans for the first unit will be drawn at once, to cost approximately $200,000. The ultimate cost of the plant is placed at $1,000,000. The present plant will be maintained for at least 24 months. A. Atwater Kent is head.

Samuel D. Miller, 1117 Foulkrod Street, Philadelphia, architect, is preparing plans for a one-story machine shop, 50 x 80 ft., estimated to cost $30,000. The owner's name will be announced later, when bids will be asked.

A power house will be built by the Modern Laundry Co., 4089 Market Street, Philadelphia, to cost about $27,000. William Lowenthal, 1208 Chestnut Street, is engineer.

The Apex Machine Co., 2801 West Susquehanna Street, Philadelphia, is taking bids for the initial machine shops for its proposed plant on property lately acquired, estimated to cost $300,000 with machinery. Ballinger & Co., Twelfth and Chestnut Streets, are architects.

The General Baking Co., Broad and Butler Streets, Philadelphia, will commence the erection of a one-story power plant. C. B. Comstock, 110 West Fortieth Street, New York, is engineer.

The Engineering Tool Corporation, 1434 Brandywine Street, Philadelphia, plans the installation of one or more universal grinding machines.

A manual training department will be installed in the three-story and basement junior high school, 150 x 180 ft., to be erected at Anne, Tulip and Memphis Streets, Philadelphia, estimated to cost $750,000, for which bids are being taken on a general contract. The Board of Education is in charge.

A refrigerating plant, power equipment and other machinery will be installed at the Abbotts Alderney Dairies, Inc., 222 Lombard Street, Philadelphia, in connection with extensions and improvements to cost about $600,000. Christian R. Lindback is president.

Fire, April 24, destroyed a portion of the main plant of the Tacony Steel Co., Milnor and Bleigh Streets, Tacony, Philadelphia, with loss estimated at $100,000 including machinery. It is planned to rebuild at once.

The Atlantic City Light & Power Co., Atlantic City,

N. J., has acquired the Cape May Power & Light Co., Cape May, N. J., and plans for extensions and improvements in the power house and system, including the installation of additional equipment.

The Atlantic Brick Co., Mays Landing, N. J., plans for the immediate rebuilding of its plant and power house destroyed by fire April 26, with loss estimated at $150,000 with machinery.

Bids will be received until May 8 by the Commissioner of Institutions and Agencies, State Office Building, West Hanover Street, Trenton, N. J., for refrigerating equipment and system to be installed at the State Agricultural College, New Brunswick. Plans and specifications at the office of the Division of Architecture and Construction.

The Reading Knob Works, Oak Brook, Reading, Pa., has plans for a two-story and basement foundry additon, 35 x 80 ft., to cost about $36,000. Claude B. Mengel, 1122 Penn Avenue, Wyomissing, Pa., is architect.

The Brown Engineering Co., 123 North Third Street, Reading, Pa., manufacturer of forgings, etc., plans for the installation of spur and beveled gear cutters and other equipment.

The West Chester Cold Storage & Ice Co., West Chester, Pa., plans for the immediate rebuilding of the portion of its plant, including power house, destroyed by the bursting of a flywheel April 25, with loss approximating $90,000 including machinery.

The Counties Gas & Electric Co., Ardmore, Philadelphia, has perfected plans for the construction of a steam-operated power plant on Barbadoes Island, Schuylkill River, opposite Norristown, Pa., with capacity of 65,000 hp. It will cost in excess of $350,000.

G. Bauer, Second Avenue, Royersford, Pa., has commissioned J. V. Poley, 162 Second Avenue, architect, to prepare plans for a one-story machine shop to cost about $23,000.

H. M. Stauffer & Son, Leola, Pa., operating a sheet metal works, plan for the installation of a shearing machine, cornice breaker and other equipment.

The Harrisburg Light & Power Co., Harrisburg, Pa., has plans for a 60,000 hp. electric generating plant on Cedar Street, to cost in excess of $2,000,000. Work is under way on the first unit, to include the installation of a 10,000 hp. turbo-generator and auxiliator and auxiliary machinery, and this section of the plant will cost approximately $500,000. Automatic coal-handling machinery will be installed.

A manual training department will be installed in the two and one-half story school, 92 x 150 ft., to be erected at Bryn Mawr, Pa., to be known as the Baldwin school, estimated to cost $500,000. Allen & Collins, 75 Newberry Street, Boston, are architects.

Fire, April 26, destroyed the plant of the Christiana Planing Mills, Christiana, Pa., with loss of about $100,000, including machinery and power equipment. Plans are being considered for rebuilding.

R. M. Roderick, Jermyn, Pa., is planning for the establishment of a metal-working plant to manufacture kitchen appliances, etc.

A one-story power house will be constructed by the Confederated Home Abattoir Co., Bethlehem, Pa., at its new plant on the Mauch Chunk Road, for which bids are being received until May 15. A refrigerating plant will also be installed. The entire project will cost $350,000 with machinery. The Gorman-Brown Engineering Corporation, 40 Rector Street, New York, is engineer.

The Aluminum Pigment & Products Co., Bowmansville, Pa., will install pulverizing, crushing and grinding equipment in its new building, now in course of erection. A power house will be established.

A manual training department will be installed in the two-story high school to be erected at Ashland, Pa., estimated to cost $125,000, for which ground will be broken at once. Hersh & Sholler, Commerce Building, Altoona, Pa., are architects.

The Bryden Horse Shoe Works, Catasauqua, Pa., has tentative plans for a two-story addition. The company is completing a one-story shop and will soon commence the installation of machinery.

Vocational departments will be installed in the proposed two high schools to be erected at Harrisburg, Pa., in accordance with recent recommendations of the School Board. One structure will be located in the eastern section and is estimated to cost $1,125,000. The other will be situated in the upper part of the city and will cost $810,000. An architect will soon be selected.

The Board of Commissioners of Public Grounds and Buildings, Harrisburg, Pa., Berkey H. Boyd, superintendent, will take bids until May 8 for engineering and power plant equipment and supplies for the coming year, ending May 31, 1924.

The Philadelphia & Reading Railroad Co., Reading Terminal, Philadelphia, has awarded contract to the New York Shipbuilding Co., Camden, N. J., for a power plant at its new Camden terminal, to cost in excess of $150,000. Arrangements for machinery will be made later.

Baltimore

BALTIMORE, April 30.

THE Motor Agency, Inc., Baltimore and Redwood Streets, Baltimore, will move its repair shops and service station from Redwood and Greene Streets to 1007-19 North Eutaw Street. Additional automobile repair machinery, etc., will be installed.

Plans are being made by the Central Metal & Supply Co., 609 East Lombard Street, Baltimore, for the construction of a factory at Twentieth and Mace Streets, Baltimore, on property recently purchased.

Plans have been filed by the Continental Can Co., Keyser Building, Baltimore, for a one-story addition to its plant near Bay View Junction, 69 x 100 ft. Francisco & Jacobus, 511 Fifth Avenue, New York, are architects.

The Harvey Co., 113 South Street, Baltimore, contractors' supplies, is in the market for a 10-ton electric traveling crane, 60 to 70 ft. span, second-hand.

Bids will be received until May 10 by the Bureau of Engraving and Printing, Washington, for one motor-driven engine lathe, 12 in. x 6 ft.

The Porcelain Enamel & Mfg. Co., Eighth and O'Donnell Streets, Baltimore, will take bids early in May for the initial building for a new plant at Eastern Avenue and Third Street, to be one and two stories, estimated to cost $150,000 with equipment. Plans are under consideration for a second structure, two stories, costing about $60,000. Heinrich Turk is president.

A manual training department will be installed in the proposed high school to be erected at Columbus, Ga., estimated to cost $450,000, for which an architect will soon be selected. Bonds will be voted May 31.

The Yatesville Planing Mill Co., Yatesville, Ga., is in the market for an engine, boiler and auxiliary power house equipment.

The Baltimore & Ohio Railroad Co., Baltimore, will install ten 48-in. and six 42-in. mechanical belt conveyors at its new grain elevator in the Fort McHenry section, estimated to cost $5,000,000.

The Susquehanna Power Co., Baltimore, a subsidiary of the United Gas & Electric Co., 61 Broadway, New York, recently organized with a capital of $700,000, has made application to construct a hydroelectric power plant on the Susquehanna River, near Havre-de-Grace, Md., with ultimate capacity of 360,000 hp. The complete project will involve $1,200,000. A steel tower transmission line will be built.

The Economy Concrete Co., Inc., Richmond, Va., lately formed with a capital of $100,000, has acquired about 5 acres for the erection of a new plant to manufacture concrete products, estimated to cost $65,000. J. Scott Parrish is president.

The Lane Co., Inc., Altavista, Va,, manufacturer of cedar chests, will build a new power house, with initial installation totaling 600 hp. Lockwood, Greene & Co., Charlotte, N. C., are architects.

The Carolina Power Co., Raleigh, N. C., is planning the erection of a new electric generating plant in the vicinity of Fayetteville, N. C., estimated to cost $750,000 including machinery. Extensions will be made in the transmission system.

Mechanical conveyors, motors, hoppers and other electrical and mechanical equipment will be installed in the new mill to be erected by the Hill Flour Mills Co., Greensboro, N. C., recently organized with a capital of $300,000, estimated to cost $200,000. William B. Hill heads the company.

J. V. Thompson, South Boston, Va., is organizing a new company to build a factory for the manufacture of veneers, to cost about $50,000, including machinery. A site has been secured and plans will be prepared at once. A power house will be built.

The Maryland Public Service Co., Hagerstown, Md., is being organized as a subsidiary of the American Water Works & Electric Co., 50 Broad Street, New York, to take over and consolidate the Potomac Public Service Co., Hagerstown, and the Cumberland-Edison Co., Cumberland, Md. A bond issue of $3,983,000 is being arranged to carry out the merger, a portion of the proceeds to be used for extensions and improvements in power plants and system.

A manual training department will be installed in the new high school to be erected at Mocksville, N. C., estimated to cost $100,000, for which ground will be broken at an early date.

The Lucas Lumber Co., High Point, N. C., recently organ-

ized with a capital of $500,000, plans for the erection of a mill, with power house and machine shop, estimated to cost $200,000 with machinery. J. W. Welborn heads the company.

The Hunt Mfg. Co., 103 Mercer Street, Baltimore, manufacturer of dies, etc., has acquired the plant and business of the Mergenthaler Co., 118 Hollingsworth Street, specializing in the production of reamers and kindred cutting tools. The new owner will continue this line of manufacture, and will turn over the Mergenthaler plant for the present to the manufacture of screw machine products and similar work under contract.

The International Automobile Association, English and North Main Streets, High Point, N. C., recently organized, plans for the erection of a factory for parts production, machine operations, etc. T. J. Hutchens is president.

The Savannah Co-Operative Creamery Co., 414 East Oglethorpe Avenue, Savannah, Ga., is in the market for motors, boiler and other power equipment for installation at its plant.

The Flexible Saw Works, Union, S. C., recently formed with a capital of $250,000, plans the establishment of a factory to cost close to $90,000, with machinery. K. D. Wilson is president.

Fire, April 18, partially destroyed the lumber plant of C. M. Wall & Son, Southmont, N. C., including power house, with loss estimated at $150,000, including machinery. It is planned to rebuild at once.

A power house will be built in connection with the new plant to be erected by the Oakboro Cotton Mill, Albemarle, N. C., at Oakboro, N. C., estimated to cost $200,000. It will be electrically-operated and motors and other electric power machinery will be installed. J. A. Grooves is president.

A power house will be constructed by the J. M. Swindell Co., Washington, N. C., in connection with a new packing plant and lime works, estimated to cost $100,000. An ice-manufacturing and cold storage plant will also be installed.

A manual training department will be installed in the new high school to be erected at Scotland Neck, N. C., estimated to cost $90,000, for which bids will soon be asked. The School Board is in charge.

The Blair Limestone Co., Millville, Md., is planning for the installation of additional machinery and power equipment.

R. P. Johnson, Wytheville, Va., machinery dealer, is in the market for a 20-hp. hoisting engine with boiler.

The Common Council, Walnut Cove, N. C., is disposing of a bond issue of $100,000, a portion of the proceeds to be used for the installation of a municipal electric plant.

The Coleman-Vaughan Furniture Co., Pulaski, Va., recently organized with a capital of $250,000, has plans for the erection of a new factory to cost approximately $100,000, including machinery. A power house will be constructed. T. C. Coleman is president and general manager, and B. C. Vaughan, vice-president.

The Gloucester Ice & Refrigerating Co., Gloucester, Va., recently formed, is planning the establishment of an ice-manufacturing plant, estimated to cost $65,000. Alanson Crosby, Belroi, Va., is president.

The Blue Ridge Diamond Coal Co., Whitesburg, Ky., has acquired property in the Big Black Mountain district, Lee County, Va., and plans for the installation of a mining plant, including electric power equipment, conveying and hoisting machinery and other apparatus. A lumber mill, with power house, is also being considered.

Detroit

DETROIT, April 30.

BIDS will be taken at once by the Paige-Detroit Motor Car Co., McKinstry Building, for a new one-story assembling plant estimated to cost $250,000. Albert Kahn, 1000 Marquette Building, is architect.

The Galvin-Gilmour Body Corporation, Detroit, manufacturer of automobile bodies, will have plans prepared for rebuilding the portion of its works destroyed by fire April 19, with loss estimated at $75,000, including machinery.

The Interstate Machinery Co., 901 Guaranty Trust Building, Detroit, is in the market for a number of machine tools, bench tools, transmission equipment and miscellaneous machine shop apparatus.

A manual training department will be installed in the new junior high school to be erected at Port Huron, Mich., estimated to cost $300,000, for which bids on revised plans will be taken at once. Van Leyen, Schilling, Keough & Reynolds, 3440 Cass Avenue, Detroit, are architects.

The Federal Mfg. Co., Holland, Mich., recently organized with a capital of $250,000 to take over the plant and business of the Federal Stamping Co., has purchased land adjoining the works and plans the erection of an addition to cost about $150,000, with machinery.

The Peerless Tool Co., 1498 Twenty-third Street, Detroit, has inquiries out for machine tools and other machine shop equipment.

A power house will be constructed by the Valley City Milling Co., 217 Michigan Street, Grand Rapids, Mich., in connection with a new flour mill on Turner Street, estimated to cost $600,000 with machinery.

Motors, conveying machinery and other equipment will be installed in the two-story and basement printing plant, 50 x 235 ft., to be erected by the Dearborn Publishing Co., Dearborn, Mich., estimated to cost $250,000, with machinery.

The Lincoln Motor Car Co., 6200 West Warren Street, Detroit, has commenced the erection of a one-story addition, 250 x 1250 ft., to be equipped as a machine shop. It will cost close to $500,000 and is expected to be ready for the machinery installation early in July.

The McLouth Foundry Co., Marine City, Mich., has work in progress on rebuilding the portion of its plant destroyed by fire a number of weeks ago. The new plant has been leased by C. E. Kramer, head of the Gierholt Mfg. Co., and in the future will be operated for the manufacture of iron and steel castings in connection with the last noted company. The former capacity of the plant will be enlarged.

The Monroe Electric Railway & Equipment Co., Munch Building, Monroe, Mich., manufacturer of electric railroad line equipment, trolley stands, etc., is planning the erection of a new factory estimated to cost $75,000. James J. Kelley heads the company.

A company has been organized at Charlotte, Mich., to manufacture electrical switches and other devices as perfected by C. D. Bottomley of that city. Other Charlotte men interested are L. H. Leach, Rollo Maple, H. B. Stercks and Lee Chandler.

The Oakland Motor Car Co., Pontiac, Mich., is contemplating building a $40,000 enameling plant as an addition to its main works. It will have a capacity of 500 cars per day.

Preliminary work has been started on a new water power factory for the Ford Motor Co. at Adrian, Mich., where two hydroelectric power stations are to be built. A plant, 40 x 200 ft., will be erected for the manufacturing of automobile parts.

Pittsburgh

PITTSBURGH, April 30.

APRIL was not as productive of machine tool orders as the previous month with most of the local trade, but the average was fairly well up to that of the first three months of the year. Firms which noted a recession in orders in April expect May to restore their first quarter average.

Crane orders and inquiries are fairly numerous and makers of rolling mill equipment are getting a very satisfactory volume of miscellaneous business and are hopeful that some of the big projects which have been pending for some time, notably those of the Steel Corporation, will be closed soon. There seems to be some hesitancy in granting appropriations for some of the big installations, but with the steel companies now showing substantial earnings, it is expected they will soon be less prone to delay new construction and betterments which will reduce operating costs. A feature of the power equipment market is the demand for electric mill drive motors to replace steam engines.

Several steam hammers are listed in the week's business in machine tools. The National Tube Co. has bought a 6000-lb. steam drop Chambersburg hammer for its Gary tube works. We also note the sale of three 1500-lb. single frame and one 5000-lb. double frame steam Chambersburg hammers. The National Tube Co. still has another hammer to place. The West Virginia Coal & Coke Co., Elkins, W. Va., recently closed against a list which included a gap lathe, a 20-in. shaper, a 150-ton wheel press, a 20-in. drill press and a small hacksaw. The Westinghouse Electric & Mfg. Co. has begun purchases against its quarterly list.

Tendency among steel companies to replace steam with electric power for mill drives is evident in recent power equipment orders. The Bethlehem Steel Co. is electrifying the 40-in. blooming mill at its Lackawanna works, which has been steam driven. It has placed an order for one double-unit reversing blooming mill motor, rated at 7000 hp. continuous at 50 r.p.m. It will have a maximum speed of 120 r.p.m. In connection with this motor will be furnished one flywheel motor generator set, consisting of one 3750-hp. 50-deg. 6600-

volt, three-phase, 25-cycle, 8-pole, 367-r.p.m. wound rotor induction motor, to drive a sheet bar mill. The Westinghouse Electric & Mfg. Co. will furnish this equipment. The Jones & Laughlin Steel Corporation has placed an order with the General Electric Co. for one 5750-hp. 94-r.p.m. three-phase 25-cycle, 6600-volts induction motor, which will drive an 18-in. bar mill; also for a duplicate motor for a 21-in. bar mill, both to be installed at the Aliquippa works, Woodlawn, Pa.

The Inland Steel Co., Indiana Harbor, Ind., has placed an order with the General Electric Co. for one 4500-hp. 500-300 r.p.m. 2200-volts induction motor with Kraemer control to drive a merchant mill. It has placed with the Westinghouse Electric & Mfg. Co. a 6250-hp. 50-deg. 2200-volts, three-phase, 25-cycle, 8-pole 368 r.p.m. wound rotor induction motor to drive a 24-in. continuous billet mill; one 10,000-kw., three-phase, 25-cycle, 2400 volts, turbo generator unit; also a 1500-hp. 50-deg. 2200-volts, three-phase, 25-cycle, 8-pole, 368-r.p.m. wound rotor induction motor to drive a sheet bar mill.

The Knoxville Iron Company, Knoxville, Tenn., has ordered from the General Electric Co. one 800-hp. 900-720 r.p.m. 2200-volts induction motor to drive a merchant mill. The National Tube Co. has placed three 1500-kw. motor generator sets, three-phase, 25-cycle, 6600-volts, a. c. or 250 volts d. c., with the General Electric Co. for its new tube works at Gary. For this plant the Electro-Dynamic Co. has been awarded a number of small variable speed d. c. motors.

The Jacobson Engine Works, whose plant at Warren, Pa., was destroyed by fire a short time ago, has secured a new location at Titusville, Pa., and will be in the market for equipment. Bert H. Johnson is manager.

The McCabe & Sheeran Machinery Corporation, 50 Church Street, New York, used and used machinery, will open a branch office in the Jones Building, 530 Fourth Avenue, Pittsburgh.

Preliminary plans are being prepared for a new factory for the Mine Safety Appliance Co., 909 Chamber of Commerce Building, Pittsburgh. B. H. Prack, Keystone Building, is architect.

The Air Reduction Sales Co., 342 Madison Avenue, New York, manufacturer of oxyacetylene welding and cutting equipment, has acquired property at Sharon, Pa., for a new plant to cost approximately $200,000 with machinery. Francisco & Jacobus, 511 Fifth Avenue, New York, are architects.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, manufacturer of enameled iron sanitary fixtures, will commence the erection of two additions to its plant at Preble Avenue and Ontario Street, estimated to cost $65,000.

A manual training department will be installed in the two-story and basement high school to be erected at Washington, Pa., estimated to cost $130,000, for which bids will be called at once on a general contract. George W. Brugger, 28 North Central Avenue, Canonsburg, Pa., is architect.

The Standard Motor Car Co., Butler, Pa., recently organized to take over the automobile plant and interest of the Standard Steel Car Co., is planning for enlargements. New departments will also be established for the manufacture of four and six-cylinder automobiles.

The Pennsylvania Railroad Co., Central District, Pittsburgh, will make improvements and extensions in its yards and shops at Mingo Junction, Ohio, to cost about $500,000, with equipment. The work will include a one-story steel car repair shop, one-story machine shop, oil works and other departments.

The Virginia Power Co., Charleston, W. Va., is perfecting plans for a new power house at the mouth of Cabin Creek, with capacity of 50,000 kw. It will cost close to $400,000, with machinery.

The Nypenn Furniture Co., Warren, Pa., has plans for the erection of a four-story addition, 40 x 55 ft., estimated to cost $50,000.

The Wheeling Coal Co., Richland, W. Va., has acquired local coal properties, and plans the installation of electric power and mechanical equipment. Frank Costanzo is president.

An ice and refrigerating plant will be installed in the new four-story market building to be erected by the Charleston Market Co., Charleston, W. Va., estimated to cost $400,000.

The Franklin Steel Works, Franklin, Pa., manufacturer of steel-reinforcing rods, etc., a subsidiary of the Chicago Railway Supply Co., Chicago, is perfecting plans for a one-story addition, 45 x 425 ft.

The Chippewa New River Coal Corporation, Beckley, W. Va., recently organized with a capital of $1,000,000, plans the installation of electric power and mechanical equipment on coal properties acquired in Fayette and Raleigh counties. George L. Miller, Beckley, heads the company.

The West Penn Power Co., West Penn Building, Pittsburgh, is disposing of a preferred stock issue of $500,000, the entire proceeds to be used for additions to electric power plants and transmission systems.

The Charleston Paper Mfg. Co., Nitro, W. Va., is considering plans for the construction of a pulp mill at its local paper plant, recently completed. It will cost in excess of $150,000, with machinery. R. C. Stewart is secretary.

The Connellsville Iron Works, Inc., Sixth Street, Connellsville, Pa., plans the erection of a one-story addition, 110 x 125 ft., to be used as a fabricating plant. W. E. Kelly is general manager.

Buffalo

BUFFALO, April 30.

THE automobile industry is still making heavy demands on local machine tool manufacturers, especially drop forge plants working on truck axles and crank shafts. Recent shipments include some heavy machinery for the Willys Overland Co., Toledo, and there are a large number of orders booked for the smaller combination slitting shears, punch and bar cutters. Outside of the orders for single end cutters being placed by the drop forge plants in the automobile industry, few single purpose machines are being bought.

The Farrell Foundry & Machine Co., Buffalo, has added considerable equipment, including a number of gear machines, boring and planing mills and smaller tools. Business is reported unusually brisk.

Plans are being arranged for the immediate rebuilding of the portion of the plant of the National Roofing Co., Tonawanda, N. Y., destroyed by fire April 20, with loss estimated at $75,000.

The Electro-Metal Radiator Corporation, 706 Iroquois Building, Buffalo, E. Rowland Blasdall, representative, is considering plans for new works at Lockport, N. Y.

The machine and repair shops of the Elmira, Corning & Waverly Interurban Railway Co., Corning, N. Y., at South Corning, were partially destroyed by fire April 24 with loss estimated at $55,000, including a car barn adjoining. It is planned to rebuild.

The Kinney-Thompson Electric Co., 560 State Street, Watertown, N. Y., plans the installation of a precision lathe, toolmakers' type.

The Commissioner of Public Works, Room 3, Municipal Building, Buffalo, will receive bids until May 8 for one portable air compressor, gasoline engine operated; two mechanical valve operating devices, mounted on trucks; one chain and bucket type trenching machine, gasoline engine operated; and one caterpillar back-filler, gasoline engine operated, for the Bureau of Water. Arthur W. Kreinheder is commissioner.

The Autopticon Co., Inc., Paddock Arcade, Watertown, N. Y., manufacturer of special machines, is considering plans for new works to cost approximately $85,000 with machinery. E. J. Garono, 451 Main Street, Buffalo, heads the organization.

George Charnock, Buffalo, formerly superintendent at the mechanical plant of Learman-Wende-Charnock, Inc., and Charles A. Winegar, have organized Charnock-Winegar, Inc., to operate a general machinery business at 160-62 Ellicott Street.

The Empsall Co., Court Street, Watertown, N. Y., manufacturer of wireless equipment, plans the installation of an engine lathe.

The Adams Axle Co., Syracuse, N. Y., affiliated with the Durant Motors, Inc., 1819 Broadway, New York, and the New Process Gear Corporation, Syracuse, will occupy the former plant of the Monarch Typewriter Co., for the manufacture of axles for Durant and Star automobiles. The structure will be remodeled and additional machinery installed.

The Elmira Water, Light & Railway Co., Elmira, N. Y., plans for the installation of mechanical fuel-handling equipment at its proposed local power house. F. H. Hill is general manager.

A manual training department will be installed in the three-story high school to be erected on Lafayette Avenue, Syracuse, N. Y., 140 x 200 ft., estimated to cost $500,000, for which bids are being asked on a general contract until May 14. T. H. Mather, City Hall, is architect.

The E. W. Washburn Co., Redwood, N. Y., operating a machine works, plans for the installation of a turret lathe, grinder and other equipment.

The Taggart Brothers Paper Co., West Main Street, Watertown, N. Y., is said to be arranging a list of machine tools and other equipment for its machine shop.

Motors, conveying machinery and other mechanical equipment will be installed in the new plant to be erected by the

Addison Lithographing Co., 59 South Avenue, Rochester, N. Y., estimated to cost $90,000.

G. A. Wenger, 12 Amherst Street, Rochester, N. Y., is planning for the installation of additional ice-manufacturing equipment.

The Ogdensburg Power & Light Co., Ogdensburg, N. Y., will build a new four-story operating building, estimated to cost $150,000 with equipment.

The Malrose Iron & Fuel Corporation, Fluvanna Avenue, Jamestown, N. Y., plans for the installation of mechanical coal-handling equipment.

A manual training department will be installed in the new high school to be erected at Hornell, N. Y., to replace a school on Lincoln Street recently destroyed by fire. It will cost $250,000. Bids are being asked on a general contract until May 11. Tooker & Marsh, 101 Park Avenue, New York, are architects.

Cleveland

CLEVELAND, April 30.

REPORTS of machine tool builders indicate that sales during April were about the equivalent in volume to those in March. While orders with some fell off, others booked more business than in the preceding month. Business with local dealers was about equal to that of March.

The demand from Detroit automobile companies continues active. The Ford Motor Co., which has been steadily buying machine tools for some time, is still adding to its equipment. During the week the Oakland Motor Car Co. placed an order for 12 turret lathes with a local manufacturer and another car builder purchased 21 lathes. The Standard Tool Co., Cleveland, placed an order for 12 Pratt & Whitney automatic lathes. The Central Steel Co., Massillon, Ohio, purchased a second-hand 60 in. saw. New inquiries include one from the Youngstown Sheet & Tube Co., Youngstown, for 8 or 10 machines, including a 42 and 30-in. lathe, a planer and large horizontal boring machine. A local machine tool builder has an inquiry from the Santa Fe Railroad for 5 turret lathes. Manufacturers of automatic screw machines report a fair volume in small lot orders.

While the crane market is not active it shows an improvement as several inquiries for single cranes are pending.

The Lake Erie Metal Products Co., Cleveland, will erect a new plant, 60 x 160 ft. at Maple Heights, a Cleveland suburb. In addition to automobile axle shafts, which is its present line of products, the company will manufacture automobile gears and will be in the market for gear making equipment.

The Barberton Foundry Co., Barberton, Ohio, has commenced the erection of three factory buildings, 40 x 200 ft., 40 x 80 ft., and 40 x 60 ft., respectively.

The Cleveland Tractor Co. at a recent stockholders' meeting authorized the lease of its plant to the Rollin Motors Co., which will use it for the manufacture of a new model of automobile designed by Rollin White, president of the Tractor company, and formerly vice-president and chief engineer of the White Co. Under the proposed plan the Rollin company will manufacture tractors for the Cleveland Tractor Co., in addition to making automobiles.

The Bernhard Boiler Co., Elyria, Ohio, has acquired the plant of the Lima Steel Castings Co., Lima, Ohio, and will locate there. The Bernhard company, which has been incorporated with a capital stock of $300,000, will manufacture heating boilers. J. B. Bernhard is president and general manager. B. F. Thomas, who was president of the Lima company, will be chairman of the board of the Bernhard company, and M. L. Johnson, who was general manager, will be secretary and treasurer of the Bernhard company.

The American Vitrified Products Co., Lisbon, Ohio, will erect a new plant to replace one recently burned.

The Pittsburgh Plate Glass Co. has completed plans for new cement works at Zanesville, Ohio, adjoining its present limestone crushing plant. It will include a main building, 100 x 670 ft.; machine shop, 60 x 205 ft.; power house, and several other structures. Contracts have been placed for the turbine generators and switchboards with the Allis-Chalmers Mfg. Co., Milwaukee; boilers with the Edgmore Iron Co., Pittsburgh; mills with the Allis-Chalmers Mfg. Co., and coal pulverizing plant with the Fuller-Lehigh Co., Allentown, Pa.

The Kapper Enamel Co., Bellaire, Ohio, has extended its plant by the erection of two buildings, the larger 120 x 180 ft.

The American Mine Door Co., Canton, Ohio, will shortly move its plant to the former Canton Spring factory of the Standard Parts Co., which it recently purchased.

The plant of the Ohio Cutlery Co. was recently burned and the company will re-establish itself in new quarters shortly.

The Bakelite Corporation, New York, has acquired the plant formerly occupied by the Lake Erie Foundry & Vulcan Co., Painesville, Ohio, and will use it for the manufacture of phenol.

The plant of the Supreme Motors Co., Warren, Ohio, has been sold at public auction by the trustee in bankruptcy to George T. Fillius, as agent, for $55,000.

E. M. Freese & Co., Marion, Ohio, manufacturers of brick and tile making machinery, have had plans prepared for the erection of a foundry at an estimated cost of $100,000.

The Chapman Engineering Co., Mt. Vernon, Ohio, has been awarded contract for complete gas producer equipment for the new Gary tube works of the United States Steel Corporation.

The Shelby Spring Hinge Co., Shelby, Ohio, has placed contract for the erection of a two-story and basement addition, 161 x 171 ft.

The Pittsburgh-Erie Saw Co. will establish a plant in Akron, Ohio, where it has leased a two-story factory at 1006 Grant St.

Chicago

CHICAGO, April 30.

THE Illinois Central has placed the remainder of its outstanding list, involving approximately $125,000. This road bought about $150,000 forth of tools a month ago, so that its total purchases will aggregate close to $300,000. Including the orders just received from the Illinois Central, the sales of local dealers during April will closely approximate the totals for March. The extensive pending lists from the Santa Fe, the Chicago & North Western and the Elgin, Joliet & Eastern promise good business in the coming weeks. While orders from miscellaneous sources have been fewer the past week or two, the reaction following recent price advances appears to have spent itself and renewed buying on a more active scale is gathering headway.

Buying is largely for the purpose of completing existing production facilities and consequently orders, as a rule, cover from one to three machines. Two important local manufacturers of ice skates have moved to larger quarters and have bought some additional equipment. The Nestor Johnson Mfg. Co. purchased a number of presses and the Alfred Johnson Skate Co. closed for a number of polishing machines and presses. The Studebaker Corporation, South Bend, Ind., has placed orders for two 20-in. shapers. The city of Chicago takes bids today on a 20-in. x 12-ft. high duty belt-driven engine lathe and a 3-ft. triple purpose plain radial drill arranged for motor-drive. The Denver & Rio Grande Western will construct a new shop at Denver, Colo., which will require considerable machine tool equipment.

A Western manufacturer of hack saws has advanced prices approximately 10 per cent, but otherwise no further price changes have been announced. While no new advances are contemplated, it is known that machine tool manufacturers are still greatly concerned about labor costs and complain particularly of a shortage of skilled mechanics.

The Electric Rotary Machine Co., 40 South Clinton Street, Chicago, has purchased a two-story plant comprising 15,000 sq. ft. of floor space at 3825-31 West Lake Street.

The Undertakers' Supply Co., 214 South Kedzie Avenue, Chicago, is taking bids through Frank O. DeMoney, 5 North LaSalle Street, on a four-story factory, 34 x 90 ft., at Ann Street and Washington Boulevard, to cost $50,000.

H. D. Curtis, 1119-23 West Jackson Boulevard, Chicago, is taking bids through F. M. Barton, 3426 South Kedzie Avenue, on a two and six-story addition, 56 x 106 ft., to an electric fixtures factory, to cost $225,000.

The Hotel LaSalle Co., 10 North LaSalle Street, Chicago, has awarded a contract for a six-story garage, 40 x 180 ft., 209-11 West Washington Street, to cost $200,000.

The Coca Cola Co., Atlanta, Ga., has let contract for a five-story factory, 100 x 250 ft., at 4000-20 West Filmore Street, Chicago, to cost $250,000.

F. H. Noble & Co., 535 West Fifty-ninth Street, Chicago, manufacturer of advertising specialties, has let contract for a two-story plant, 96 x 124 ft., at 535-545 West Fifty-ninth Street, to cost $85,000.

W. G. Garvey, 4916 Bloomingdale Avenue, Chicago, has let contract for a one-story foundry, 63 x 73 ft., at that address, to cost $6,600.

Loren Kennedy, J. F. Rude and J. E. Roughan have organized a company to erect a new foundry at Liberty, Ind. It will be located near the plant of the Rude Mfg. Co., but will be operated independently.

The heat treating department of the Continental Motors Co. plant at Muskegon, Mich., was recently destroyed by fire with a loss of $50,000.

The Auto Specialty Co., Elkhart, Ind., will build an addition to cost $12,000.

The Richsto Mfg. Co., Aurora, Ill., recently incorporated with $35,000 capital stock, will manufacture steel building supplies, including such specialties as metal bases, chair rails, window and door casings, window stools, picture molding, corner beads, etc. Negotiations are in progress for plant space. Officers are C. H. Richards, president and treasurer; Oscar Yasche, vice-president; and J. H. Stoltz, secretary.

The Frank Foundries Corporation, Moline, Ill., has started the construction of an addition to cost $20,000.

The Indiana Mfg. & Electric Co., Marion, Ind., recently organized, will manufacture electric supplies, having taken possession of the former plant of the Globe Stove Co. at Twelfth and Race Streets.

The Schuessler Foundry Co., Alton, Ill., has started the construction of a new foundry building.

The National Plate Glass Co. has awarded contracts for the construction at Ottawa, Ill., of a four-story factory, 160 x 400 ft., to cost several million dollars. The contract for the structural steel, involving 9000 tons, has been placed with the Mississippi Valley Structural Steel Co.

The Illinois Malleable Iron Co., 1801 Diversey Parkway, Chicago, has commenced the erection of a one-story addition, 80 x 100 ft., at 1603-29 Nelson Street.

The Chicago Fire Brick Co., 133 West Washington Street, Chicago, plans the erection of a one-story plant on Kenilworth Street to cost about $30,000.

A manual training department will be installed in the two-story and basement high school to be erected at DuQuoin, Ill., estimated to cost $110,000. R. Z. Gill, Murphysboro, Ill., is architect.

William Gaertner & Co., 5345 Lake Park Avenue, Chicago, manufacturers of scientific instruments, will take bids for the erection of a new plant at 2545 North Racine Avenue, estimated to cost $60,000. Schmidt, Garden & Martin, 104 South Michigan Avenue, are architects.

The American Coil Spring Co., 1455 West Thirty-seventh Street, Chicago, is planning for the installation of a lathe, drill press and other equipment.

A manual training department will be installed in the two-story and basement high school to be erected at Lankin, N. D., estimated to cost $90,000, for which bids are being received on a general contract until May 8. The Board of Education is in charge.

Fire, April 21, destroyed a portion of the plant of the Twin City Brass & Aluminum Foundry Co., 815 Washington Avenue, S. E., Minneapolis, Minn., with loss estimated at $25,000. It is planned to rebuild.

The Standard Four Tire Co., Thirty-second and Jackson Streets, Keokuk, Iowa, is planning the erection of a one-story power house, 30 x 45 ft. E. W. Bierman is engineer.

The Rosen Machine Works, 126 West First Street, Davenport, Iowa, plans for the erection of a two-story and basement machine shop on Second Street, estimated to cost $25,000. Joseph Rosen is head.

The Sunburst Refining Co., First National Bank Building, Great Falls, Mont., has plans for a new refinery on local site, estimated to cost $450,000 with machinery. E. A. Wyatt is general manager.

A manual training department will be installed in the new high school to be erected at Beardstown, Ill., estimated to cost $300,000, for which an architect will soon be selected. C. J. White is president of the school board.

Milwaukee

MILWAUKEE, April 30.

VOLUME of machine-tool orders booked by local manufacturers in April indicates a well-sustained gain over March. It is particularly encouraging that sales of milling machines were larger than in March, which was the best month in the past six. Inquiries are coming more freely and while no large lots are projected, the aggregate of single and small-lot sales which are expected to be closed in May probably will make the coming month the best since Jan. 1. The market is still surfeited with used machinery which offers keen competition to new tools, on the basis of strict economy being practiced by all buyers. Automotive industries are still buying equipment, but sales are slowly declining as major needs have been filled. Railroad business is improving and much is expected from this source in the next two to three months.

The Milwaukee Central Board of Purchases, J. W. Nicholson, chief buyer, is taking bids until May 10 for furnishing one 25-ton electric traveling crane for the new Riverside pumping station.

The Ford Motor Co., Detroit, is undertaking new construction and equipment work involving $2,500,000 or more in connection with the large sawmill and automobile body and body stock plant established during the past three years at Iron Mountain, Mich. Additions will be made to the existing body factories and an entirely new body manufacturing unit will be provided. Other units include a combination steam and hydroelectric generating plant; a distillation plant; a carbonization building; a maintenance building, and an addition to the existing sawmill. Equipment specifications are now being framed and purchasing will start shortly.

The Valley Paper Mills, Inc., 145 West Wisconsin Avenue, Neenah, Wis., is in the market for four 400 hp. boilers among other equipment needed for a steam generating plant addition designed by Cahill & Douglas, consulting engineers.

The Racine Radiator Co., Racine, Wis., has been incorporated with a capitalization of 2000 shares of non-par common and $35,000 preferred stock, by Fred M. Young, Racine, and Donald McLeod and E. M. Alexander of Milwaukee, who purchased the entire assets of the defunct Perfex Radiator Co., Racine, at receiver's sale for $125,000 on April 21. The new ownership is making extensive changes and replacing and adding to equipment. Orders for automobile radiators aggregating more than $100,000 in value are on the books. Mr. Young acted as general manager of the plant during the receivership period, the plant being operated as a going concern.

The Gilbert & Nash Co., Menasha, Wis., has been organized with a capital of 350 shares of non-par value common stock to manufacture machinery, appliances, mechanical equipment and accessories. W. M. Gilbert, William C. Nash and George D. Barnes are the incorporators. Mr. Gilbert is prominent in the paper manufacturing industry and while details of plans of the new company are withheld until more fully matured, it is said that its activities will be largely in the direction of buildng paper and pulp mill equipment.

The A. Libert Machine Co., 324 North Roosevelt Street, Green Bay, Wis., has plans for a one-story brick and steel shop addition, 53 x 100 ft., for which a small list of miscellaneous equipment will be required. The concern manufactures special paper mill machinery and does an extensive jobbing business. Arthur Libert is president and general manager.

The Chicago & North Western Railroad Co. plans an investment of $400,000 to $500,000 in new locomotive and car repair and service shops, a 30-stall roundhouse, car foreman's shops and a cold storage plant on a 60-acre site at Madison, Wis., the work to be undertaken this summer. A list of shop equipment will be required, but it is not likely it will be issued until after June 1.

The Jenkins Machine Co., Sheboygan, Wis., has disposed of its engine-stop department to the Gas Combustion Co., Pittsburgh, and will devote all of its floor space to the production of general wood-working machinery, principally tools for furniture factories. Some changes and additions are being made in the equipment. A. G. Stuedeman is president and general manager.

The Oilgear Co., 60-66 Twenty-seventh Street, Milwaukee, manufacturer of hydraulic presses and other shop equipment specialties, has increased its capital stock to $500,000 preferred and 5000 shares of common stock without par value. It is enlarging its floor space and adding more machinery to increase production. J. R. Swigart is secretary-treasurer.

The Board of Education, Green Bay, Wis., let the general contract for the erection of a new high school to Bertlettson & Ness, Minot, N. D., at $486,500. It will contain manual training facilities and cost, complete with equipment, $600,000.

The Green Bay Newspaper Co., Green Bay, Wis., publisher of the *Daily Press-Gazette*, closes bids May 15 on the construction of a new plant estimated to cost $125,000, at Walnut and Madison Streets. The architects are Foeller, Schober & Stephenson. Purchases of presses, motors and other equipment are now being made.

Cincinnati

CINCINNATI, April 30.

WHILE business in April fell off slightly from the total of March, the number of orders booked was satisfactory, and with a resumption of railroad buying in sight, as evidenced by the issuing of a number of large lists, prospects for the future are regarded as very encouraging. During the past week a few new inquiries appeared and while mostly for single machines the aggregate was large. The Menominee & Marinette Electric Light & Traction Co., Menominee, Mich., is inquiring for 10 miscellaneous machines. Some automobile buying was also reported, but the bulk of the orders came from general industrial sources.

Local shops are running overtime in many cases, due to the scarcity of mechanics, which adds considerably to production costs. It is reported that advances will be made in prices within the next week or two, particularly in the case of engine lathes.

The A. W. Bowen Co., Indianapolis, dealer in automobiles, will erect a sales and service station at a cost of $80,000. A repair department will be installed.

The Buckeye Tile Co., Chillicothe, Ohio, has purchased the Arbenz auto factory on Washington Avenue, and alterations are being made to convert the property into a tile manufacturing plant. The company plans the expenditure of $75,000 in remodeling the plant, and for the installation of machinery. John C. Strayer, York, Pa., is president of the company.

The Stevenson Gear Co., Indianapolis, manufacturer of gears and gear cutting machines, plans the installation of additional equipment to increase the output. G. E. Stevenson is president.

Additional equipment will be installed in the new plant of the Dayton Appliances Co., Dayton, Ohio, manufacturer of automobile accessories and screw machine products, in the Fyr-Fyter Building, which the company has leased.

The Mitren Metal Products Co., Springfield, Ohio, has been incorporated with a capitalization of $10,000 to manufacture portable garages and other metal products and has established a plant at Center and Jefferson Streets. R. C. Schuster and R. C. Reynolds head the company.

Indiana

INDIANAPOLIS, April 30.

DAY & ZIMMERMAN, INC., 611 Chestnut Street, Philadelphia, engineer, has plans for a one and two-story addition to the works of the International Harvester Co., Pontiac Street, Fort Wayne, Ind., for motor truck manufacture. A one-story power house will also be built. The expansion is estimated to cost $300,000. Headquarters of the company are at 606 South Michigan Avenue, Chicago.

The Shunkard Brothers Co., Brazil, Ind., manufacturer of automobile bodies, has acquired property adjoining its plant and plans the erection of an addition.

A manual training department will be installed in the new high school to be erected at Terre Haute, Ind., estimated to cost $700,000, for which bids will be called on a general contract early in May. Johnson, Miller & Miller, 30 North Fifth Street, are architects.

Fire, April 23, destroyed the repair shop and car barn of the Terre Haute, Indianapolis & Eastern Traction Co., Indianapolis, at Richmond, Ind., with loss estimated at $100,000, including equipment. It is planned to rebuild.

Miller & Pursel, Indianapolis, have arranged for the establishment of a new machine shop at Massachusetts Avenue and Pratt Street.

A manual training department will be installed in the new high school to be erected at Wheatland, Ind., estimated to cost $90,000, for which bids have been asked on a general contract. Osterhage & Sutton, Citizens Trust Building, Vincennes, Ind., are architects.

The General Motors Service Co., Walnut and Illinois Streets, Indianapolis, will commence the construction of an addition, 70 x 100 ft., to double the present capacity. A machine shop for the production of parts will be installed, as well as a radiator repair and sheet-metal working department, welding shop and battery service shop. W. A. Engelhart is president.

The Wabash Valley Electric Co., Clinton, Ind., is perfecting plans for a merger with the Putnam Electric Co., Cayuga Electric Co., Gosport Electric Co., Morgan County Light & Power Co. and other smaller organizations in this section. The power plants will be enlarged and improved, and extensions made in the transmission system. To carry out the merger and provide funds for expansion, the company will dispose of a bond issue of $1,561,700.

A manual training department will be installed in the two-story community high school to be erected at Butler, Ind., estimated to cost $85,000, for which work will be placed in progress at once. A. H. Elwood & Sons, 201 Haynes Building, Elkhart, Ind., are architects.

The Indiana Power Co., Vincennes, Ind., is planning the construction of an addition to its generating plant, with installation to include a 10,000 kw. generator and auxiliary equipment. Extensions and improvements will also be made in the transmission lines. A preferred stock issue of $1,000,000 is being sold to be used in part for the expansion. H. L. Clarke is president.

The Kramer Mfg. Co., 602 South New Jersey Street, Indianapolis, manufacturer of furniture, has plans for a new factory on LaSalle Street, estimated to cost $250,000 with machinery.

The Central South

ST. LOUIS, April 30.

THE Wabash Railway has purchased the following machine tools in addition to those listed in THE IRON AGE of April 19:

Thirteen No. 60 Boyer riveting hammers.
Six No. 66 master riveting hammers.
Two Columbia 32-in. standard heavy crank shapers.
Three Columbia 32-in. extra heavy crank shapers.
One 300 amp. portable electric welder.
One 200 amp. portable electric welder.
Three No. 4 Elesco feed water heaters.
One valve setting machine.
One pressure recording gage.
Two Elwell-Parker crane trucks.
One spindle and disk sander.
One magnetic separator.
One 48-in. car wheel borer.
One 600 hp. Stillwell feed water heater.
One 10 x 11 x 12-in. air compressor.
Two No. 41 inspection motor cars.
One 100-ton hydraulic forcing and bending-press.
One Niagara power shear.
One 16-in. engine lathe.
One 90-in. locomotive axle journal turning lathe.
One No. 2 universal cutter and reamer grinder.
One Imperial bridge repair outfit.
Two Imperial tie stamping outfits.
Two Jaeger No. 4H mixers.
One 18-ton standard gage No. 3 locomotive crane.
One 32-in. Morton draw cut shaper.
One auto chisel mortiser.
One tenoning machine.

The Roxana Petroleum Corporation will erect a machine shop in connection with a new $4,000,000 oil refinery to be built at Arkansas City, Kan. A few machine tools are still to be bought by the purchasing department in St. Louis.

The Heine Boiler Co., St. Louis, is enlarging its facilities to manufacture boilers of 2000 hp. A tank rolling machine and multiple drill have been ordered.

Work will soon be placed in progress on a one-story foundry and machine shop, 100 x 150 ft., for the Heating Range Mfg. Co., 4716 Fairmont Avenue, Kansas City, Mo. It will cost about $35,000. It is expected to exceed the output of the initial plant and arrangements will be perfected for the casting of certain parts at an outside foundry.

Fire, April 18, destroyed a portion of the plant of the Richardson Oil Co., El Dorado, Ark., including air compressor works, with loss estimated at $75,000 with equipment. It is planned to rebuild.

W. O. Ellis, P. O. Box 216, Mammoth Spring, Ark., is in the market for a lathe, drill press and other machine tools, with belting, hangers and other transmission equipment.

The Stockton Electric Light Co., Stockton, Mo., has plans for the construction of a hydroelectric power plant on the Sac River, estimated to cost $80,000.

The Standard Tool & Machine Co., Bristow, Okla., recently organized, has acquired property on Second Street and will commence the erection of a new one-story plant to cost about $40,000. A list of machinery will be prepared.

A manual training department will be installed in the new high school to be erected at Warrensburg, Mo., to cost about $300,000, for which plans will be prepared at an early date.

The Price Motor Co., Baxter Springs, Kan., is planning for the installation of a cylinder grinder and other equipment at its machine shop.

The Common Council, Muskogee, Okla., has commissioned Black & Veatch, 701 Mutual Building, Kansas City, Mo., engineers, to prepare plans for extensions and improvements in the municipal electric plant and system including the installation of additional machinery, estimated to cost $50,000.

William C. Moeller, Inc., 314 Westport Avenue, Kansas City, Mo., recently organized, has plans for the erection of a one-story factory for the manufacture of wrought iron lighting fixtures and other ornamental metal products William C. Moeller is president and C. L. Dunvey secretary and treasurer.

The American Machine Works, Inc., P. O. Box 1707, Picher, Okla., has inquiries out for a portable electric grinder, electric-operated drill, lathe chucks and other small tools for installation at its machine shop. F. S. Scott is head.

The Common Council, Nowata, Okla., is planning for the installation of electrically-operated pumping machinery at the municipal waterworks in connection with extensions and improvements estimated to cost $100,000. The Benham Engineering Co., Gumbel Building, Kansas City, Mo., is engineer.

The Duncan Machinery Co., P. O. Box 265, Knoxville, Tenn., machinery dealer, has inquiries out for pumping equipment, either belt or electrically-operated.

The Moore Co., Burrton, Kan., operating the Palace Garage, is in the market for a lathe and other equipment for its machine shop.

The Broens-Weller Truck Body Co., 345 Jefferson Avenue, Memphis, Tenn., manufacturer of automobile bodies, has plans for the construction of a two-story addition, estimated to cost $50,000, with machinery.

The Missouri Pacific Railroad Co., St. Louis, is perfecting plans for a one-story machine shop at its local repair works. The company will purchase other machine tools and equipment for installation at its shops at Dennison, Tex.

A manual training department will be installed in the two-story and basement addition to be erected to the high school at University City, Mo., estimated to cost $135,000, for which ground will be broken at once. William B. Ittner, Board of Education Building, St. Louis, is architect.

The Wright & Pile Lumber Co., Cedar Springs, Tenn., recently organized, has plans for a new lumber mill, with power house, in the Sequatchie Valley section, estimated to cost $85,000, with machinery. J. Walter Wright and Edward Pile head the company.

The National Asphalt Refining Co., Nevada, Mo., recently organized, is planning for a new local refining plant to cost close to $400,000. A power house and machine shop will be erected. The company will operate with a capital of $1,500,000.

The Atlas Cabinet Fixture Co., Kansas City, Mo., has awarded a contract to the Havens Structural Steel Co., 7319 East Seventeenth Street, for a one-story and basement plant at 2459-63 Charlotte Street, 72 x 156 ft., to cost $23,000, exclusive of machinery. A list of equipment will soon be arranged.

A manual training department will be installed in the new two-story and basement high school to be erected at Herman, Mo., estimated to cost $85,000. H. D. Pampel, 403 Finance Building, Kansas City, Mo., is architect.

In connection with its additions the Crane Enamelware Co., Chattanooga. Tenn., a subsidiary of the Crane Co., Chicago, will construct a large foundry for the production of sinks and other cast iron sanitary fixtures. The expansion will cost approximately $200,000.

C. L. Reveal, 1722 Jackson Street, Kansas City, Mo., has inquiries out for a planer, saws, sander, motors, transmission equipment and other apparatus for a proposed planing mill.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has plans for a one and two-story foundry on South Shipp Street, Louisville. It will cost in excess of $50,000. D. K. Murphy & Brothers, Louisville Trust Building, are architects.

A manual training department will be installed in the two-story high school to be erected at Dayton, Ky., estimated to cost $100,000, for which C. C. & A. E. Weber, Ingalls Building, Cincinnati, architects, will prepare plans.

Electric power equipment, conveying machinery and other mechanical apparatus will be installed in the five-story printing plant, 100 x 218 ft., to be erected by the Gibbs-Inman Co., 325 West Broadway, Louisville, for which a general contract has been awarded to the C. A. Koerner Co., East Burnett Street, estimated to cost $300,000.

The Gulf States

BIRMINGHAM, April 30.

BIDS will soon be called by the Royal Palm Rubber Co., West Palm Beach, Fla., recently organized, for the erection of a new plant for the manufacture of automobile tires and other rubber products, on site selected at Kelsey City, Fla., estimated to cost $75,000. William Manly King, West Palm Beach, is architect. Gordon Ware is secretary.

The City Council, Shreveport, La., has tentative plans for a municipal electric light and power plant to cost $500,000.

J. W. Davis, 2810 Elm Street, Dallas, Tex., is in the market for a punch press, milling machine and small tools.

The Lufkin Chair & Handle Co., Lufkin, Tex., will rebuild the portion of its plant recently destroyed by fire, to include two one-story structures, 40 x 80 ft. and 40 x 60 ft., respectively. A list of machinery will soon be arranged.

A manual training department will be installed in the new three-story junior high school to be erected at Riverside Park, Miami, Fla., estimated to cost $150,000. H. Hastings Mundy, Miami, is architect.

P. W. Collins, Summerfield, Fla., has inquiries out for woodworking machinery for the manufacture of handles and other turned wood products, including planer, motors, sander, transmission equipment, etc., for installation in a proposed local plant.

R. L. Martin, 9 Merchants Block, Ocala, Fla., is in the market for machinery for the manufacture of cement blocks.

The State Appropriation Committee, Austin, Tex., is arranging funds for new buildings and equipment at different institutions during the present year as follows: Vocational and trades school building at the State juvenile school, $100,000; machine shop at the orphans' home, $15,000; industrial building with machinery at the school for the colored deaf, dumb and blind, $65,000; industrial building at the Wichita Falls insane asylum, $15,000; ice-manufacturing plant at the Austin insane asylum, $25,000. The State Department of Buildings will be in charge.

W. M. Dodson, Wedowee, Ala., is organizing a company to construct and operate an electric light and power plant at Heflin, Ala., estimated to cost $40,000.

The Superior Lime & Hydrate Co., Pelham, Ala., recently organized, will build a power house at its proposed local hydrate lime plant, estimated to cost $65,000. W. D. Lewis, Jr., and H. G. Bridgewater head the company.

The Mississippi Foundry & Machine Co., Jackson, Miss., has awarded a contract to W. J. McGee, Jackson, for a one-story machine shop, 60 x 165 ft., estimated to cost $35,000. Julius Mosal is president.

A power house will be constructed by the Greenville Mill & Elevator Co., Greenville, Tex., in connection with its proposed new flour milling plant, estimated to cost $300,000, with machinery. A. F. Richter is general manager.

The Powell Motor Co., Vicksburg, Miss., plans to rebuild the portion of its works destroyed by fire April 23, with loss estimated at $75,000, including equipment.

The Baton Rouge Electric Co., Baton Rouge, La., is arranging an appropriation of $1,000,000 for extensions and improvements in its electric generating plant and system. The work will include the erection of an addition and the installation of a 3000-kw. generator and auxiliary machinery, estimated to cost $300,000. The company is operated by the Stone & Webster Management Corporation, 147 Milk Street, Boston.

The Common Council, Umatilla, Fla., will receive bids until May 8 for an electrically-operated centrifugal pump with capacity of 500 gal. per min. for installation at the local waterworks. The H. S. Jaudon Engineering Co., Winter Haven, Fla., is engineer.

The Verda Lumber Co., Vinegar Bend, Ala., recently organized, plans for the erection of a new mill. A power house will also be constructed. The plant is estimated to cost $80,000. E. H. Turner heads the company.

The Tuscaloosa Railway & Facilities Co., Tuscaloosa, Ala., is planning the erection of a new ice-manufacturing and cold storage plant on Fourth Street, to cost about $75,000.

A manual training department will be installed in the new two-story school to be erected by the Caddo Parish School Board, Shreveport, La., at Cedar Grove, to cost about $150,000.

The Consumers' Ice Co., Broad Street and Nebraska Avenue, Tampa, Fla., has plans for a branch ice-manufacturing and refrigerating plant at Sulphur Springs, Fla., estimated to cost $80,000 with machinery. Clyde Perry is general manager.

The Phillips Petroleum Co., Bartlesville, Okla., will build four new gasoline refining plants at Bunger, Oil City, Herron City and South Bend, Tex., to cost approximately $700,000 with machinery. The installation will include air compressors, electric power equipment, pumping machinery, etc.

A manual training department will be installed in the new two-story school to be erected by the Jefferson Parish School Board, Gretna, La., on Kenner Street, estimated to cost $200,000. William T. Nolan, Canal Commercial Building, New Orleans, is architect.

The Common Council, Mount Dora, Fla., has called a special election May 12 to vote bonds for $40,000 for the installation of a municipal electric power plant. Plans will soon be prepared.

The Dallas Brass Mfg. Co., 2810 Elm Street, Dallas, Tex., is in the market for a No. 125 or No. 150 crucible-size, second-hand gas or oil-fired tilting furnace for brass melting, with or without blower.

Canada

TORONTO, April 30.

DEMAND for machine tools has fallen off slightly the past week, but business is still considerably above that for the corresponding period a year ago. On the other hand, however, inquiries are numerous and prospects for a good demand in the future are bright. While no specific lists have been issued by the railroads of late, there is still considerable buying on this account to be done. The large lists closed by the Canadian National Railways last month were chiefly on new works account, and did not have in view the elimination of much of the old equipment, and efficiency experts in railroad shops are now turning their attention to more modern equipment. It is reported that the Canadian Pacific Railroad will spend upward of $7,500,000 on extensions and equipment for its system this year and also proposes to purchase rolling stock, etc., at a cost of $12,295,000.

The automobile industry has been furnishing a good share of the machine tool business of late, about $250,000 being spent on equipment already for the new plant of the Ford Motor Co. of Canada at Ford, Ont. Additional equipment is being installed in the plant of Durant Motors, Ltd., at Leaside, Ont. The Collins Motor Products, Ltd., has secured a site at Belleville, Ont., and will establish a plant for which equipment will be required. Buildings and equipment for the new plant at Hamilton, Ont., of the Hamilton By-Products Coke Ovens Co. will cost $2,000,000. A strong demand for machinery is also reported from pulp and paper concerns and also for electrical equipment for power development.

The secretary of the Board of Control, Ottawa, Ont., will receive bids for the supply of electrical equipment and apparatus. A. F. Macallum is commissioner of works.

J. R. Booth, Ltd., Booth Street, Ottawa, Ont., will erect a turbine building to cost $30,000.

The Brown Corporation, Ltd., La Tuque, Que., has purchased a 400 acre site at St. Angele de Laval, Que., and proposes to erect paper mills at a cost of $5,000,000. George Boswell, 19 St. Genevieve Street, Quebec, is manager.

Neil G. Beggs, 6 Jean Street, Toronto, will call for bids about May 15 for a factory 100 x 600 ft., two-stories; office building, 110 x 50 ft., two-stories; and a two-story assembling building, 100 x 600 ft. of brick and steel.

Kilgour Brothers, 21 Wellington Street, Toronto, will call for tenders for the erection of a factory at Windsor Mills, Que., to cost $100,000. D. C. Cotton, 54 Adelaide Street West, Toronto, is architect.

The Austin Construction Co., Cleveland, Ohio, has the general contract for an addition to the plant of the R. N. Boxer Co., at New Toronto, to cost $100,000.

The Quebec Brass & Foundry Co., has moved its plant and office from 111 Mountain Hill to 55½ Commercial Street, Levis, Que.

Charles Murphy, Western manager of the Canadian Pacific Railway, is in Vancouver, B. C., to decide the type of building required to replace the shops recently destroyed by fire there. The new shops will cost $100,000 and will be larger than the old and contain new equipment.

Collins Motor Products, Ltd., has purchased a site at Belleville, Ont., from the J. C. Wilson Co., and proposes to erect a plant for the manufacture of motor car bodies. A. H. Collins is general manager.

According to E. A. Barnes, of the Semet-Solvay Co., who has the contract for plant to be erected at Hamilton, Ont., for the Hamilton By-Products Coke Ovens Co., the complete project will represent an expenditure of $2,500,000. Buildings and equipment will cost $2,000,000 and approximately 90 per cent of this amount, or $1,800,000 will be spent in Canada. Contracts for electrical equipment have not been awarded. The plant is expected to be in operation by November.

T. Lewis, 804 Lewis Building, 17 St. John Street, Montreal, is in the market for a power punch.

H. J. Jones & Sons, Dundas Street, London, Ont., will require equipment for a box factory in connection with new plant to replace one recently destroyed by fire.

The Granby Clay Products, Ltd., Granby, Que., is interested in equipment for a factory to manufacture brick, etc. A. Labelle is purchasing agent.

M. Meloche, 2218 Jeanne Mance Street, Montreal, will purchase equipment for blacksmith and machine shops.

The Pacific Coast

SAN FRANCISCO, April 25.

ABOUT three acres has been acquired by the Pacific Gas Radiator Co., 1710 West Washington Street, Los Angeles, on the Harbor Truck Boulevard, for a one-story foundry, 100 x 100 ft. Other buildings will be erected later.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has arranged an appropriation of $100,000 for extensions and improvements in its power house and system at Marysville, Cal.

The Columbia County Lumber Co., St. Helenes, Ore., has tentative plans for rebuilding the portion of its plant destroyed by fire April 23, with loss estimated at $300,000, including machinery and power house.

Morrow & Garren, Chronicle Building, San Francisco, architects, are preparing plans for a one-story machine shop, 75 x 250 ft., estimated to cost $60,000, for which the owner's name will soon be announced. Bids will be called at an early date.

The Western Oil Co., Seattle, is planning for the construction of new storage and distributing plants at Aberdeen and Hoquiam, Wash., to cost approximately $75,000, with equipment.

The Consumers' Central Heating Co., Tacoma, Wash., has plans under consideration for a new heating and power plant at Astoria, Ore., to cost about $110,000 with machinery. Harry A. Flood is vice-president.

The National Ice & Cold Storage Co., Newman, Cal., has plans for the construction of a one-story ice-manufacturing and refrigerating plant estimated to cost about $40,000.

The Standard Auto Body Co., 1501 Central Avenue, Los Angeles, will commence the erection of a two-story plant, 50 x 150 ft., estimated to cost $80,000, including machinery.

The Federal Tank & Pipe Co., 5445 Shilshole Street, Seattle, has plans for a one-story addition, 70 x 160 ft.

The Kern Clay Products Co., 277 Hawthorne Avenue, Portland, has acquired the plant of the former Pacific Brick Co., Willamina, Ore., and will extend and improve the works for the manufacture of tile, blocks, etc. It is purposed to install additional equipment. L. E. Kern and C. E. Jensen head the company.

The Heywood Brothers & Wakefield Co., Irving and Ninth Streets, Portland, manufacturer of furniture, is considering preliminary plans for rebuilding the portion of plant destroyed by fire April 11, with loss estimated at $300,000, including machinery.

The Inland Oil Refining Co., San Bernardino, Cal., recently organized, is planning the erection of a new refinery on West Rialto Avenue, estimated to cost $100,000 with machinery. Jefferson G. Crawford, Los Angeles, is one of the heads of the company.

The Western Cedar Pole Preserving Co., Yardley, Wash., plans the construction of a power house in connection with its local plant, estimated to cost $100,000 with equipment. O. S. Hanson is president.

A manual training department will be installed in the new high school to be erected at Huntington Park, Cal., by the Huntington Park Union School District, estimated to cost $400,000.

The Southern California Edison Co., Los Angeles, has arranged an appropriation of $26,000,000 for initial work in connection with a new hydroelectric power plant at Big Creek, on the San Joaquin River. The complete plant is estimated to cost $100,000,000.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.54c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.64c.
Channels, angles and tees under 3 in. x ¼ in., base	3.54c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.80c.
Toe-calk, ½ x ⅝ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth spring-steel	5.00c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c. to 4.65c.
Squares, flats and hex	4.90c. to 5.15c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

Tank Plates—Steel

¼ in. and heavier	3.64c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.59c.
No. 12	4.64c.
No. 14	4.69c.
No. 16	4.79c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.90c. to 5.30c.	.....
Nos. 22 and 24	4.95c. to 5.35c.	5.60c.
No. 26	5.00c. to 5.15c.	5.65c.
No. 28	5.10c. to 5.50c.	5.75c.
No. 30	5.30c. to 5.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	5.20c. to 5.60c.
No. 16	5.35c. to 5.75c.
Nos. 18 and 20	5.50c. to 5.90c.
Nos. 22 and 24	5.65c. to 5.95c.
No. 26	5.80c. to 6.20c.
No. 27	5.95c. to 6.35c.
No. 28	6.10c. to 6.50c.
No. 30	6.60c. to 7.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt	—44	—29	½ in. Butt	— 4	+19
¾ in. Butt	—49	—36	¾ in. Butt	—11	+ 9
1-3 in. Butt	—52	—33	1-1½ in. Butt	—14	+ 6
2½-6 in. Lap	—48	—35	2 in. Lap	— 5	+14
7-8 in. Lap	—44	—17	2½-6 in. Lap	— 9	+ 9
9-12 in. Lap	—38	—14	7-12 in. Lap	— 3	+16

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	5.00c.
Annealed soft	5.00c.
Galvanized annealed	5.65c.
Coppered basic	5.65c.
Tinned soft Bessemer	6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	21⅞c. to 22⅞c.
High brass wire	22⅜c. to 23⅜c.
Brass rods	19⅛c. to 20⅛c.
Brass tube, brazed	28⅞c. to 29⅞c.
Brass tube, seamless	25⅛c. to 26⅛c.
Copper tube, seamless	27¾c. to 28 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 25½c. to 26½c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Prime	Seconds
IC	$11.00	$9.75	80 lb.	$6.30	$6.05
IX	12.25	11.00	90 lb.	6.40	6.15
IXX	13.50	12.25	100 lb.	6.50	6.25
IXXX	14.75	13.50	IC	6.65	6.40
IXXXX	16.50	14.75	IX	7.65	7.40
			IXX	8.65	8.40
			IXXX	9.65	9.40
			IXXXX	10.65	10.40

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits pig	48c.
Bar	55c. to 60c.

Copper

Lake ingot	19 c.
Electrolytic	18½c.
Casting	18¼c.

Spelter and Sheet Zinc

Western spelter	8½c.
Sheet zinc, No. 9 base, casks	11c. open 11½c.

Lead and Solder*

American pig lead	9¼c. to 9¾c.
Bar lead	12½c. to 14c.
Solder, ½ and ½ guaranteed	33½c.
No. 1 solder	31½c.
Refined solder	28c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c. to 90c.
Commercial grade, per lb	35c. to 50c.
Grade D, per lb	25c. to 35c.

Antimony

Asiatic	9½c. to 10c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	32c. to 33c.

Old Metals

The market is very inactive and values declined again during the week. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	14.00
Copper, heavy wire	13.50
Copper, light and bottoms	11.50
Brass, heavy	7.75
Brass, light	6.50
Heavy machine composition	11.00
No. 1 yellow brass turnings	8.25
No. 1 red brass or composition turnings	9.75
Lead, heavy	6.75
Lead, tea	5.00
Zinc	4.50

MAY 12 1923
CHEM. LIBRARY
Chemical Library
MAY 14 1923

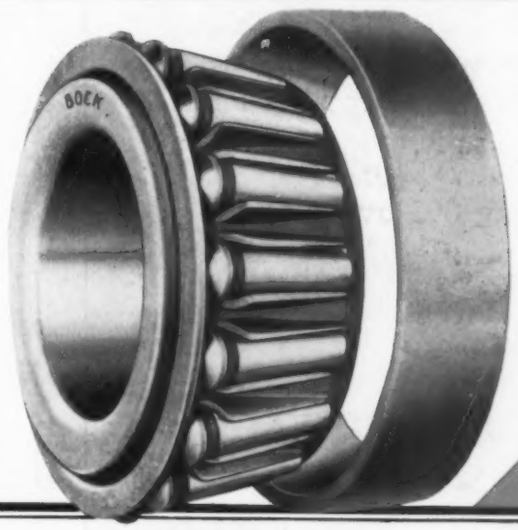
TABLE OF CONTENTS - - - - 1249

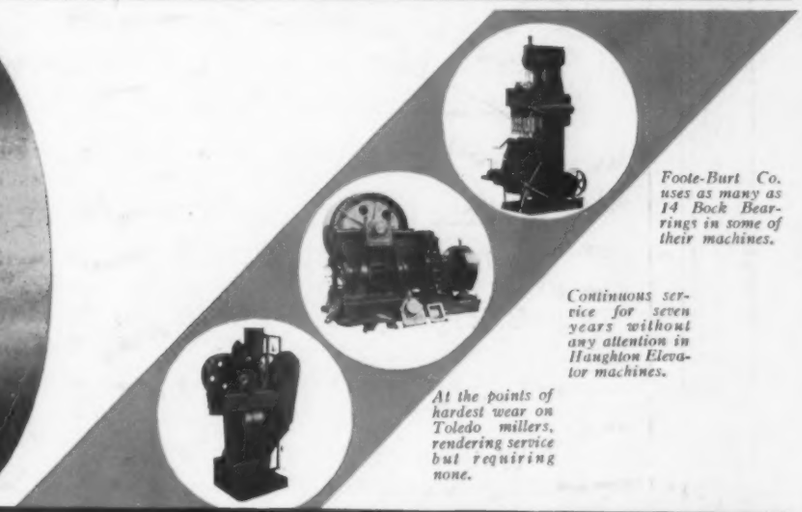
THE IRON AGE

Published Weekly
Vol. 111, No. 19

NEW YORK, N. Y., MAY 10, 1923
Entered as second-class matter June 18, 1879, at Post Office at New York under the Act of March 3, 1879

Six Dollars a Year
Single Copy, 25 Cents





Foote-Burt Co. uses as many as 14 Bock Bearings in some of their machines.

Continuous service for seven years without any attention in Haughton Elevator machines.

At the points of hardest wear on Toledo millers, rendering service but requiring none.

Why Use Anti-Friction Bearings?

The original Bock Bearings are still in use on the first heavy duty Cleveland Automatic.

"The only bearings which meet the severe requirements of this machine," says A. E. R. Blomquist.

Bock Bearings were adopted for Economy Balers after severe tests of many makes.

TO eliminate friction and so save power. It's a matter of economy.

Then carry that principle all the way and select the bearing that most completely eliminates friction, that serves longest with least trouble, and is most economical.

Bock Taper Rollers, because of their unique patented design, all alloy steel construction and precise workmanship, prove their superiority by actual tests.

Their use in industrial applications has increased nearly 100 per cent in the last year.

May we submit layouts, and samples for testing?

THE BOCK BEARING COMPANY
TOLEDO, OHIO

The round head roller, found only in Bock Bearings, results in Less friction and longer service.

BOCK
Quality TAPER ROLLER
BEARINGS

G-R-O-W-I-N-G

The most convincing argument that can be presented in favor of the Improved Type Koppers Combination Oven is the constantly growing list of companies which have adopted it.

There are now built or building 693 ovens of the improved type located as follows:

Chicago By-Product Coke Co. CHICAGO, ILL.	5
Carnegie Steel Co. CLAIRTON, PA.	366
Weirton Steel Co. WEIRTON, W. VA.	37
Republic Iron & Steel Co. YOUNGSTOWN, OHIO	61
Battle Creek Gas Co. BATTLE CREEK, MICH.	11
Columbia Steel Company SALT LAKE CITY, UTAH	33
Bethlehem Steel Co., Lackawanna Plant BUFFALO, N. Y.	114
Consumers Power Company ZILWAUKEE, MICH.	19
Trumbull Cliffs Furnace Co. WARREN, OHIO	47
Total	693

Total Number of Koppers Ovens in Operation or Under Construction in the United States and Canada

7431

THE KOPPERS CO., PITTSBURGH, PA.

KOPPERS